IMPROBABLE REALISM: THE POSTWAR AMERICAN NOVEL AND THE DIGITAL AESTHETIC

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A dissertation submitted to the faculty at the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of English and Comparative Literature.

Chapel Hill
2021

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ABSTRACT

Sean DiLeonardi: Improbable Realism: The Postwar American Novel and the Digital Aesthetic
(Under the direction of Florence Dore)

This dissertation examines the influence of a new form of statistical thinking on American fiction written between 1950 and 1964, elucidating in particular a tendency by novelists seeking a departure from previous novelistic forms to incorporate mathematical improbability into literary realism. Even as literary critics in the 1950s insisted that fictional events must be probable to be realistic, the most celebrated postwar novelists were drawing from the statistical sciences tools for redefining realism as a form capacious enough for the unbelievable.

Why do we find such improbable plot twists as the *deus ex machina* in Vladimir Nabokov's *Pnin*, or the divine miracle in Flannery O'Connor's *The Violent Bear It Away*? Might we associate these portrayals of the unbelievable with the random coincidences in Patricia Highsmith's *Strangers on a Train* and the chance encounters in Ralph Ellison's *Invisible Man*? Drawing extensively on archival materials related to cryptography, cybernetics, and literary history, *Improbable Realism* shows that what links these apparent flights from reality is the same statistical thinking that gave rise to digital media during the postwar era. The digital emerged in particular from the tendency at midcentury to quantify apparently unquantifiable phenomena, and I argue that it is the surprising influence of this mathematical formalism on these novels that accounts for the new version of realism I identify. *Improbable Realism* indeed brings to light a

digital aesthetic, revealing a phase of the American novel we have not yet identified—one in which math conditions even those features of the novel that appear to resist quantification. *Improbable Realism* thus tells a new story about the American novel's entry into the digital age.

“The work of art is an ostentatiously improbable occurrence.”
— Niklas Luhmann

ACKNOWLEDGMENTS

Even acknowledgments adhere to their own narrative arc: a steady rise to the highest echelons of gratitude. To upset that form is to acknowledge up front that *Improbable Realism* would not exist without the care and support of my closest reader, Elizabeth, who believed in this endeavor from the start, and who shared in every joy and sorrow along the way. For always keeping me grounded, I am grateful to Rocco and Olive, who learned to use the word 'dissertation' at an early age, most frequently as a punchline. And to Florence Dore, I am indebted for much more than the work of a diligent advisor. Through endless consultations and conversations, Florence has not only overseen the completion of a dissertation, she has made me a more nuanced thinker, a more convincing writer, and a more rigorous reader. Her generosity surpassed expectations some time ago, and I am humbled to be her student.

To Elisa Faison, who has read more than her fair share of chapter drafts, thank you for proving that a dissertation group need consist of but one brilliant peer. Likewise, my committee deserves particular praise for seeing me through many stages of development, from oral exams and a prospectus defense to dissertation revisions and job market guidance. At each step, the contributions of Eric Downing, Matt Taylor, Kate Marshall, and Mark Goble made the work I was doing better; the questions I was asking sharper; the conclusions I was drawing clearer.

Thank you Trish, for always sending prayers, coffee, and Thai food—a treasured trifecta. Thank you to the editors at *Post45*, Sean McCann, Amy Hungerford, and Merve Emre, for

helping prepare a version of chapter one for publication, the first signs of my doctoral research out in the world. Several aspects of this dissertation have benefitted directly and indirectly from professional conversations with keen interlocutors, whose own work has inspired me, including Bernard Dionysius Geoghegan, Jed Dobson, Mark Hansen, Kate Hayles, Nan Z. Da, Alex Galloway, Mark Seltzer, Lori Emerson, Eliza Richards, GerShun Avilez, Stanislav Shvabrin, Nate Mills, Heidi Kim, Alex Corey, and Gregg Flaxman. To Gregg, and to Kim Stern, I am further indebted for direction in navigating professional terrain beyond the dissertation. To Brandon Truett, Matt Beeber, Alex Newsome, Jen Howard, Grant Glass, James Cobb, Kevin Pyon, Ben Murphy, and Tyler Bunzy, thank you for occasionally commiserating and frequently celebrating (or was it the other way around?). Joan Lubin and her work in particular has helped me to articulate what it means to write and think about the aesthetics of quantification. Along the way, I presented bits and pieces of my research at MLA, ACLA, PCA, the International Nabokov and Translation Conference, and the 20/21 Century Cultures Workshop at the University of Chicago, alongside colleagues whose various contributions together made intellectual community a necessary component of a surprisingly collaborative ambition.

I have enjoyed generous funding for this project, including research fellowships from Emory University and Carolina Public Humanities, and dissertation fellowships from the UNC Graduate School, Dean's Office, and Department of English and Comparative Literature. Without such support I would not have been able to complete invaluable archival research in the Ralph Ellison papers at the Library of Congress and in the Flannery O'Connor papers at the Rose Library at Emory.

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INTRODUCTION

The Mathematical Sublime

In his 1957 campus novel *Pnin*, Vladimir Nabokov portrays literary beauty as a matter of quantifying the unquantifiable. Early in the novel, Nabokov's protagonist Pnin experiences what the narrator describes as "that eerie feeling, that tingle of unreality."[1] The moment is attended by a "seizure," which Pnin associates with the wallpaper from his childhood bedroom.[2] As the intricate design of the wallpaper led the younger Pnin to search for its meaning, he "persevered in the struggle" to immerse himself in its "difficulties."[3] Though total comprehension continues to elude him, Pnin's efforts are rewarded when the wallpaper, as we are told, suddenly "lost its papery flatness and dilated in depth till the spectator's heart almost burst in response to the expansion." The complexity of the wallpaper overwhelms Pnin, and the "difficulty" gives way to euphoria. Pnin's examination of the wallpaper is an act of reading, and when the "papery flatness" of the wallpaper's text-like surface gives way to the emotional bursting of the reader's heart, Nabokov clearly means for us to understand the pleasure afforded by the "paper" as a literary one. Pnin's state of suffering bears out the feeling that Nabokov famously described in his postscript to *Lolita* (1955): "For me a work of fiction exists only insofar as it affords me what I shall bluntly call aesthetic bliss, that is a sense of being somehow, somewhere, connected with

[1] Vladimir Nabokov, *Pnin* (New York: Vintage, 1957).

[2] Ibid., 21.

[3] Ibid., 24.

other states of being."[4] A moment of "aesthetic bliss," and yet, from his bed, the feverish Pnin also makes observations that extend beyond flat literary pages: he notes that the design of flowers and branches on his wallpaper is divided into two "planes," that each plane features the "repetition" of "elements" in a "series" to suggest the existence of a "rational pattern." Despite his failure to identify "what system . . . governed . . . the recurrence of the pattern," moreover, the narrator suggests that Pnin owes his sense of pleasure to the realization that one nonetheless exists.[5] What should we make of the fact that in this scene of literary reading, Nabokov also construes Pnin's euphoric pleasure as explicitly mathematic?

In the "Analytic of the Sublime," from the *Critique of Judgment*, Immanuel Kant identifies what he calls "the mathematically sublime."[6] The "despair" in the face of difficult reading that leads Pnin to euphoria is explained by Kant's sublime—which is an experience of "pleasure," Kant argues, "only possible through the medium of pain."[7] Just as Pnin's feeling of "aesthetic bliss" depends on both the limits of aesthetics and the possibilities of mathematics, Kant ascribes the sublime conversion of pain into pleasure to an imbalance between two faculties within the mind of the thinking subject. Faced with the sublime object, the individual first experiences pain caused by the "inadequacy" of the imagination to generate "the *aesthetical* estimation of magnitude." The pleasure following from this comes from the surprising

[4] Vladimir Nabokov, *Lolita* (New York: Vintage International, 1955), 315.

[5] *Pnin*, 23.

[6] The mathematically sublime, which is based on magnitude in size, opposes "the dynamically sublime," which depends on dynamic force. See sections 25-27, titled "On the Mathematically Sublime" in Immanuel Kant, *The Critique of Judgment*, trans. John Bernard (New York: Cosimo, 2007 [1914]).

[7] Ibid., 74.

realization that one's rationality can "make any measure adequate to any given magnitude."[8] That is, the pain of failing to represent an immeasurable object in one's imagination gives way to the pleasure of recognizing one's ability to formally rationalize the possibility of measuring the object nonetheless. According to Kant, an immeasurable object "makes us judge as *sublime*, not so much the object, as our own state of mind in the estimation of it."[9] The Kantian sublime designates those moments in which the subject smiles at her own attempt to conceptualize infinity and thus measure the immeasurable.

Pnin's "aesthetic bliss," however, results not from a sense of overwhelming "magnitude," but from an experience dependent on observations of "repetition" and "recurrence," "series" and "pattern." The wallpaper's complex design, it would seem, leaves behind the sublime dynamics of measurability and immeasurability to instead emphasize the outer limits of quantification. As Pnin searches for "what system . . . governed . . . the recurrence of the pattern," he weighs the chances of calculating the difference between intentional design and accidental coincidence. The moment anticipates the novel's most daring innovation: it is Pnin's luck to ultimately identify the pattern of fate planned for him by the narrator and to escape through a "miracle" that comprises a *deus ex machina*: an unlikely mechanism or improbable resolution. What Kant emphasized as "the *aesthetical* estimation of magnitude" emerges in *Pnin*—and in a host of other postwar novels—as instead an aesthetical calculus of probabilities. If Kant's theory of the sublime still applies in an age in which quantifiability surpassed measurability, identifying its salience requires looking closer at a shift in the system of mathematics that enabled—even as it derived

[8] Ibid., 67, 70. As Kant explains, "Nature is therefore sublime in those of its phenomena, whose intuition brings with it the Idea of their infinity. This last can only come by the inadequacy of the greatest effort of our Imagination to estimate the magnitude of an object."

[9] Ibid., 70.

from—the emergence of digital machines.[10] Indeed, in an early observation of this new era of scientific thought, Jean-François Lyotard made the prescient argument that the sheer size of information contained within computer "data banks" indicated a new "postmodern sublime."[11] Drawing on Lyotard's work in his landmark study *Postmodernism, or the Cultural Logic of Late Capitalism* (1990), Frederic Jameson similarly described a "technological sublime" indicated by an "immense communicational and computer network" that compels postmodern art to express "the limits of figuration and the incapacity of the human mind to give representation to such enormous forces."[12] Jameson and Lyotard find literature, as opposed to architecture, film, and the visual arts, largely unsuitable to the task of demonstrating spatial totalities that might evoke such magnitude.[13] The following pages maintain the critical sense that digital media produce new aesthetic categories. At the same time, Pnin's attempt to quantify the unquantifiable, which Nabokov presents as uniquely literary, suggests that theories of a postmodern sublime miss the

[10] Unlike Quentin Meillassoux, I am not interested in overturning Kant's legacy to speculate about reality beyond human ontology; though my revision of Kant may appear as a less radical version of Meillassoux's claim that "whatever is mathematically conceivable is absolutely possible." My interest in examining how digitality produces new aesthetic categories grounds my research in matters of human expression, which remain central to any consideration of the sublime—even the digital sublime. At the least, speculative realism exemplifies the tantalizing allure of mathematic truth that also shapes the novels under consideration, in which the authority of quantification enables the most daring leaps beyond verisimilitude. See Quentin Meillassoux, *After Finitude: An Essay on the Necessity of Contingency* (New York: Bloomsbury Academic, 2008), 117.

[11] Francois Lyotard, *The Postmodern Condition*, trans. Geoffrey Bennington and Brian Massumi (Minneapolis: University of Minnesota Press, 1984), 51. Though Lyotard commented on the works of Kant throughout his career, most of his writing on "the postmodern sublime" appears in the short essay, "Answering the Question: What Is Postmodernism?" also published as an appendix in *The Postmodern Condition*.

[12] Fredric Jameson, *Postmodernism, or the Cultural Logic of Late Capitalism* (Durham: Duke UP, 1991), 34, 36. For Jameson, the "immensity" of a computer network stands in specifically for the immeasurable global infrastructure of late capitalism.

[13] Jameson's brief explanation of the postmodern sublime makes this point specifically. He notes the cyberpunk networks of William Gibson as "exceptional" in their ability to demonstrate the literary potential of documenting the new sublime experience of global capitalism (*Postmodernism*, 38).

aesthetic implications of a new era of digital quantification. By identifying only what expresses spatial "immensity," "enormity," and in general, the arithmetical limits of measurability, theorists of a postmodern sublime render the idea anachronistic from its inception.[14] As numerous media scholars writing from the vantage point of the twenty-first century make clear, the quantification of everything human would prove one of the most radical consequences of the emergence of digital media.[15] At the same time, literary scholars have forged foundational links between fiction and concepts adjacent to the digital, such as control, information, and communication, showing how literature responds in less sublime ways to the effects of twentieth-century media on language and literary form.[16] Building on both of these fields of study, contemporary literary criticism and media studies, *Improbable Realism* zeroes in on the aesthetics of quantification, updating the Kantian sublime for the digital age and thus providing literary studies with the means for discussing the novel's endemic relationship to digital media.

[14] Lyotard and Jameson were not alone in advancing these theories. With the enthusiasm to understand postmodernism during the last decades of the twentieth century, the philosophical concept of the sublime earned a prominent place in works by numerous critics and theorists. Sparking what philosopher David B. Johnson has called a "renaissance" of the sublime, continental philosophers such as Julia Kristeva, Guilles Deleuze, Jacques Derrida, and Jean-Luc Nancy also contributed to the idea of a "postmodern sublime," often through an explicit reworking of Kant's "Analytic of the Sublime" from the third *Critique*. David B. Johnson, "The Postmodern Sublime" in *The Sublime: From Antiquity to the Present*, ed. Timothy Costelloe (Cambridge: Cambridge University Press, 2012):118-131.

[15] Media scholars and historians of technology attentive to the mathematics of digital media, such as Jacqueline Wernimont, Safiya Nobel, and Cathy O'Neil, have clarified how the desire to control, count, and algorithmically track human subjects, often through the explicit exploitation of race, gender, and sexuality, served as both a fundamental impetus of digital media, as well as their dire consequence. See Jacqueline Wernimont, *Numbered Lives: Life and Death in Quantum Media* (Cambridge: MIT Press, 2018); Safiya Noble, *Algorithms of Oppression* (New York: NYU Press, 2018); and Cathy O'Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* (New York: Crown Books, 2016).

[16] See Seb Franklin, *Control: Digitality as Cultural Logic* (Cambridge: MIT Press, 2015); Katherine N. Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: Chicago UP, 1999); Mark Goble, *Beautiful Circuits: Modernism and the Mediated Life* (New York: Columbia UP: 2010)

In what follows, I will show that Pnin's wallpaper historicizes a dilemma confronting the postwar novel that still resonates today. American authors found themselves torn between two institutionally sanctioned concepts: the literary idea, on the one hand, that everything irreducible must be understood as aesthetic, and the claim made by scientists, on the other, that machines can grasp the irreducible numerically. The authors I examine—from high cultural favorites, Nabokov, Flannery O'Connor, and Ralph Ellison, to popular genre writers Patricia Highsmith and Eugene Burdick—were engaged in reconciling such oppositions by constructing an aesthetics of plot. My dissertation asks, why do we find such improbable plot twists as the *deus ex machina* in Nabokov's *Pnin*, or the divine miracle in O'Connor's *The Violent Bear It Away*? Might we associate these with the random coincidences in Highsmith's *Strangers on a Train* and the chance encounters in Ellison's *Invisible Man*? Do they clarify Burdick's against-all-odds presidential campaign in *The 480*? Drawing extensively on archival materials related to cryptography, cybernetics, and literary history, *Improbable Realism* shows that what links these apparent flights from reality is the same mathematical thinking that gave rise to digital media during the postwar era. The digital emerged in particular from efforts at midcentury to formalize apparently unquantifiable phenomena, and I argue that it is the surprising influence of this mathematical formalism on these novels that accounts for the new version of realism I identify. *Improbable Realism* indeed brings to light a digital aesthetic, revealing a phase of the American novel we have not yet identified—one in which math conditions even those features of the novel that appear to resist quantification. At the same time, the following chapters surface an aesthetics of probability foregrounded by these novels that has remained absent from both theoretical and historical accounts of digital media. *Improbable Realism* thus tells a new story about the American novel's entry into the digital age.

The Form of Postwar Realism

Improbable Realism examines the tendency of American novelists after World War II to revive a distinctively realist aesthetics of plot, particularly in response to the impetus in postwar culture to try and represent the unquantifiable. The very idea that postwar novels should be understood as realist challenges what we have understood about institutional history since at least John Guillory's *Cultural Capital* in 1993. Guillory aptly argued that the New Critics institutionalized modernism during the 1950s by associating high cultural values with modernism's "intrinsic *difficulty*."[17] With *The Program Era* (2009), Mark McGurl extended Guillory's reading to an analysis of creative writing programs, clarifying how the tenet of modernist complexity was first "codified in the pedagogy of New Criticism and then disseminated to a range of student populations previously underrepresented in the writing profession," to the degree that most postwar fiction, including "ethnic realism," formally registers "the institutionalization of modernism."[18] And indeed, by describing aesthetic complexity and psychological depth as "modernist" principles, midcentury critics made evident their commitment to securing that which is irreducible as belonging exclusively to literature. This is why paraphrasing a poem, as Cleanth Brooks famously argued, was "heresy." In the following section, I trace the sudden prioritization of literary irreducibility to a particular history of mathematics. For now, I want to emphasize how the institutional ascendancy of modernism

[17] Guillory, 173, 175. Guillory writes that "the valorization of difficulty as the general quality of poetic language was always an integral part of the New Critical agenda of canonizing the modernist poets." See *Cultural Capital: The Problem of Literary Canon Formation* (Chicago: Chicago University Press, 1993), 169.

[18] Mark McGurl, *The Program Era: Postwar Fiction and the Rise of Creative Writing* (Cambridge: Harvard University Press, 2011), 50.

was often staked explicitly against an idea of literary realism. The backdrop in which midcentury critics, as Amy Kaplan writes, made "realism an anomaly in American fiction," was noted at the time when Ian Watt recognized, in the opening pages of *The Rise of the Novel* (1957), that he was writing amidst "widespread distaste for Realism."[19] The reigning sense of postwar literature as the product of the Program Era, however, cannot explain why we find on Pnin's wallpaper a version of aesthetic complexity that authorizes Nabokov's turn to formal conventions of plot.

I define improbable realism as the formal distribution of unlikely narrative events in a manner strategically designed to prompt aesthetic estimations of authorial prowess and even literary beauty. Locating aesthetic value through the fundamental and perhaps rudimentary rubric of plot, this articulation of postwar realism contributes to work by scholars of contemporary literature who reassert the role of realism in postwar American culture, often to undo prejudices that persisted long after the decline of New Critical influence, culminating with the so-called "culture wars" at the end of the century. The oppositions of realism and (post)modernism, of "high" and "low" literary cultures, of aesthetic experimentation and traditionalism, of a mostly white, male avant-garde and a less innovative contingent of popular writers, women writers, and writers of color—such decidedly false and retrograde divisions collapse, as Amy Hungerford

[19] Kaplan offers a summary of the institutional eradication of serious attention to realist form, beginning with a generation of midcentury scholars, including the New Critics and New York Intellectuals. Kaplan claims that they achieved the popular notion that as "an inherently flawed imitation of a European tradition, realism is, in effect, un-American" (4). Writing against these trends, Richard Chase in *The American Novel and Its Tradition* (1957) invested American realism with a romantic impulse to distinguish it from the English tradition. Chase argued that "the history of the American novel is not only the history of the rise of realism, but also the repeated rediscovery of the uses of romance," with the latter defined as that which "we never *can* directly know" (xii, 27). One way to frame my interest in a midcentury form of quantifying the unquantifiable is to suggest that the new paradigm of quantification came to shape the conditions of midcentury epistemologies of knowability, in both the sciences and the humanities, that enabled Chase to describe American literature through a "circuit" that links realism and romanticism. Ian Watt, *The Rise of the Novel* (Berkeley: University of California Press, 1957), 32; Amy Kaplan, *The Social Construction of American Realism* (Chicago: U of Chicago Press, 1988); Richard Chase, *The American Novel and Its Tradition* (New York: Gordian Press, 1978 [1957]).

explains, precisely in the transition from postmodernist studies to postwar or "post45 studies."[20] Tracking the reentry of realism into the purview of contemporary literary criticism, Hungerford credits scholars such as Wendy Steiner and McGurl with dismantling the older paradigm by "[showing] how a reading of experimentalist novelists can be—and, indeed, must be—integrated with a discussion of realist writing."[21] According to Hungerford, this revisionary work established a two-part thesis: first, that postwar realist writers achieved levels of aesthetic innovation unrecognized by an entire generation of scholars working on postmodern theory and criticism; and second, that even the most experimentally modernist works of postwar fiction depended on "the sociological aspects of literature" generally associated with literary realism. As a result, regarding realism and modernism as reciprocal influences in the ecology of postwar literature has become, Hungerford concludes, "standard practice among critics working in the field."[22]

While this dissertation is indebted to this crucial development, I want to suggest, however, that what has become "standard practice" in postwar studies involves a simplification

[20] Hungerford explains that following a rejection from the Modernist Studies Association, the change in name from Postmodernist Studies Association (PSA) to the Post45 Collective grew out of the realization that the group's interests exceeded questions about (post)modernism. If, for Hungerford, adopting the use of "Post45" "implies a minimal set of assumptions about the ways the world and culture—especially American culture—changed since the end of World War II," then her essay makes clear that one of the disavowed assumptions was the reigning sense of realism's inferiority (418). See Amy Hungerford, "On the Period Formerly Known as Contemporary" *American Literary History* 20.1/2 (Spring-Summer, 2008), 410-419.

[21] Hungerford, 411. Steiner's entry on "Postmodernism" in the *Cambridge History of American Literature* details how postmodernism, understood mainly as the exhaustion of modernist experimentalism, became associated largely with the white, male avant-garde, at the expense of women writers and writers of color whose literary innovations were obscured by an otherwise "radical traditionalism." Mark McGurl's *The Program Era*, Hungerford adds, advanced this work, as McGurl reformulated the old terms of realism and modernism as "high cultural pluralism" and "technomodernism," exposing how each borrowed from the other. See Wendy Steiner, "Rethinking Postmodernism" in *Cambridge History of American Literature*, ed. Sacvan Bercovitch Vol. 7 (New York: Cambridge UP, 1999): 425-450.

[22] Ibid., 411.

of realism that risks reviving the oppositions we meant to eliminate. "Realism," as far as Hungerford, Steiner, and McGurl deploy the term, refers less to a robust theory of literary form or the cohesion of certain narrative elements and more to the presentation of social themes—a novel's emphasis on "societal dilemmas," its staging of "regionalist, ethnic, or domestic" issues, mere "sociological aspects of literature"—or simpler yet, to a literary concern with matters of identity, that is, the class, race, gender, or ethnicity of authors or fictional characters.[23] Such a theory of postwar realism only allows for the introduction of formal observations when they affirm the hegemony of modernism. That is, the assignation of "realism" in postwar studies evacuates any formally realist attributes, thus reinforcing the institutional apotheosis of modernism that began in the 1950s, rather than dismantling it. To raise the status of postwar realist writers, then, we seem to have obscured the form of realism itself.[24]

One question I hope to answer in the following pages is: how does realist form—rather

[23] Steiner, 442; McGurl, 33; Hungerford, 411. My issue here is not with the critical imperative of acknowledging the contributions of writers previously ignored. Rather, in seeking to elevate realist writers by first discovering what was already aesthetically ambitious—that is, modernist—about their work, we have failed to identify the formal, rather than sociological, features of realism that in turn inform modernist aesthetics. The important recognition of modernist aesthetics in realist literature reverts to more obvious claims when we consider only the "sociological aspects" of postmodernism—such as "the significance of Oedipa Maas as a housewife" or that Philip Roth foregrounds his "Jewishness" (Hungerford, 144; McGurl, 113). In such examples, realist "form" is meaningful only as a vehicle for identity. As a counterexample, in *Novel Sounds* Florence Dore argues for a version of postwar realism specific to southern authors that she calls "minstrel realism," identifiable not by the introduction of some sociological theme or basis of identity, but by formal attributes related to realism's incorporation of objects, in this case the technological objects of rock and roll. Such attributes exceed vague assumptions about the seemingly realistic incorporation of social life as they can be traced to theories of realism, as Dore shows, from Theodore Adorno to Roland Barthes. Florence Dore, *Novel Sounds: Southern Fiction in the Age of Rock and Roll* (New York: Columbia University Press, 2018).

[24] Deak Nabers makes this point when he argues that Ian Watt's concept of "formal realism" loses its efficacy in postwar studies. Watt argued that realism's distinctive formal development occurred in relation to philosophical and sociological ideas that emerged with the rise of the novel. But referring to McGurl's work specifically, Nabers finds that "the criteria of a writer's workshop do not necessarily link up in any way to realism of this deeper or normative kind." Deak Nabers, "The Form of Formal Realism: Literary Study and the Life Cycle of the Novel" in *Postmodern/Postwar and After: Rethinking American Literature*, ed. Andrew Hoberek, Daniel Worden, Jason Gladstone (University of Iowa Press, 2016): 159.

than thematic content, sociological representation, or political commitment—provide postwar writers with a "blueprint" for turning the inclusion of social dynamics into an aesthetic virtue of novelistic writing?[25] The message conveyed by Pnin's wallpaper, delivered by one of the most definitive postwar or "late" modernists in American literature, is that if Nabokov's novel can claim anything so aesthetically ideal as sublimity, then this effect is not independent but inextricably bound to the simple patterns and accidents that constitute a balancing of probabilities at the level of plot. As I explain in chapter one, questions of Pnin as ethnically Russian, of the novel's ambiguous gender dynamics, of its political contextualization of Cold War scientific programs such as linguistics—such questions are not merely sociological, as though historically significant apart from the novel's formal considerations, but rather commensurate with an inherently aesthetic preoccupation with unlikely literary events. *Improbable Realism* thus complements recent works of literary criticism that put pressure on the idea that socio-political representation contends with the aesthetics of modernist complexity. Attending to an "aesthetics of alterity," Dorothy Hale argues in *The Novel and the New Ethics* that modernist strategies of representing the interiority of others resolves how "the constitutive sociality of the novel's representational project has always put it in tension with the formal control and effects that would most often call forth praise of its beauty."[26] Similarly, in *The Order of Forms* Anna Kornbluh also attaches aesthetic value to sociality, and she nominates the literary formalism by which nineteenth-century realist authors construct analogs for social

[25] I am borrowing Anna Kornbluh's metaphor of a realist blueprint, which she offers as a revision of Fredric Jameson's realist floor-plan. Whereas Jameson's floor-plan links realist form to capitalism in order to understand the conditions it helps produce, Kornbluh's blueprint works less deterministically to examine a broader array of social forms that realism takes part in. Anna Kornbluh, *The Order of Forms: Realism, Formalism, and Social Space* (Chicago: Chicago University Press, 2019), 33.
[26] Dorothy Hale, *The Novel and the New Ethics*. Post45 Series (Stanford: Stanford University Press, 2021), 98.

reality—through plot, characterization, and point of view—as explicitly "mathematical."[27] But the questions these studies pose about the relationship between aesthetic form and social form look quite different within the particular context of the immediate postwar years. As the next section explains, it is not the historical emergence of mathematical formalism Kornbluh identifies but math's extension into new social domains that bends realist form towards increasingly improbable social entanglements; and it is not the explicitly modernist literary experiments with interior representation that comprise Hale's "aesthetics of alterity," but the externalized probabilities of realist plots that allowed postwar writers to formally model social life.

Literary History and Probability

In "The Concrete Universal" (1954), W.K. Wimsatt reiterated Brooks's "heresy of paraphrase," arguing that literature comprises that "which can never be expressed in other terms." The literary, Wimsatt claimed, "is like the square root of two or like pi, which cannot be expressed by rational numbers, but only as their *limit*."[28] By contrasting the "limit" of "rational numbers" to the ostensible limitlessness of theoretical numbers like π, Wimsatt meant to summon the authority of the mathematically unquantifiable as an analogue of the linguistic and aesthetic complexity the New Critics generally associated with modernism. In *Mimesis* (1945), Erich Auerbach inaugurated a particular version of the passage from realism to modernism that I want to present as key to midcentury claims of literary irreducibility. Announcing that modernism defied realism's emphasis on a series of external events that moved between the

[27] See Anna Kornbluh, *The Order of Forms*.

[28] W.K. Wimsatt, *The Verbal Icon* (Lexington: University of Kentucky Press, 1954), 83.

caprices of fate and heroic actions, Auerbach claimed instead that the literary event had disappeared. Gone are the "great changes, exterior turning points, let alone catastrophes" that defined realist form; under modernism, he wrote, they "do not occur."[29] With these words, Auerbach established an indelible link between modernism and the complexities of subjective interiority, a link that persists not only in Wimsatt's celebration of irreducibility but throughout twentieth-century literary theory.[30]

To situate the idea of literary irreducibility within the context of midcentury mathematics, I want to draw attention to a subtle distinction upon which Auerbach's account depends. When Auerbach writes that modernism "put the emphasis on the random occurrence, to exploit it not in the service of a planned continuity of action but in itself," he suggests that the transition between realism and modernism isn't simply a matter of spatial reorientation—from external social spaces to internal psychological ones—but an altered mode of representation based on different conceptualizations of chance.[31] In his account of Western literature as the mimetic

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[29] Erich Auerbach, *Mimesis: The Representation of Reality in Western Literature*, trans. Willard Ropes Trask (Princeton: Princeton UP, 1953 [1946]): 546.

[30] Traces of this literary history can be found, for example, in the influential *Realism in Our Time* (1955), wherein Georg Lukács took "change and development to be the proper subject of literature," thus leading him to favor realism for its aesthetic expression of "actual events." In his account, social change is made possible, not by the "abstract potentiality" of modernism, but by the "concrete potentiality" of realism. This distinction resembles what I explain as two logics of probable verisimilitude: "Abstract potentiality belongs wholly to the realm of subjectivity; whereas concrete potentiality is concerned with the dialectic between the individual's subjectivity and objective reality. The literary presentation of the latter thus implies a description of actual persons inhabiting a palpable, identifiable world." Georg Lukács, *Realism in Our Time: Literature and the Class Struggle* (New York: Harper & Row, 1971 [1955]): 23-25. More recently, Jacque Rancière, in "The Thread of the Novel," takes Virginia Woolf's phrase "the life of the soul" as evidence of modernism's pursuit of the purest kind of internal "truth," in which fiction is "wrested from the tyranny of the plot" (205). Rancière develops the idea of a dialectic of action and truth, an expression of the "pure miracle" of modernism as opposed to the mere events of realism. Such divisions between body/soul, action/truth, and event/miracle offer further evidence of what this section identifies as the dispersal of two logics of verisimilitude into notions of quantifiable and unquantifiable phenomena. See Jacques Rancière, "The Thread of the Novel" *Novel* 47.2 (Summer 2014): 196-209.

[31] Auerbach, 552.

"interpretation of reality," Auerbach views chance as that which provides both realism and modernism with a sense of verisimilitude, that is, the likely appearance of or similarity to truth. But in realism, Auerbach explains, truth derives from the "randomness and contingency of the exterior occasion," the accidental nature of real events through which human actions and character decisions—an entire world of social phenomena—gain meaning. Conversely, "randomness and contingency" function in modernism as an internal mechanism, "a chance occasion releasing processes of consciousness," that feels aesthetically different but still experientially true.[32] The difference opposes the supposedly singular "impression of an objective reality" with the exponentially vaster "wealth . . . of a whole subjective universe"—the limited brevity of discrete events with unlimited psychological response—distinctions that anticipate Wimsatt's mathematical opposition of finite numbers and π (535, 538).

In mathematics, the concept of probability encompasses both meanings of chance that Auerbach takes pains to distinguish. In fact, in *The Emergence of Probability* (1975), Ian Hacking described the primary condition of the probabilistic revolution around 1700 as the formation of a discursive "duality."[33] Hacking defines modern probability as the coexistence of two meanings, what he calls the epistemic and the aleatory. By aleatory, Hacking means the objective measurement of probability, or "the statistical, concerning itself with stochastic processes." And by epistemic, Hacking refers to the subjective comprehension of probability, "dedicated to assessing reasonable degrees of belief in propositions quite devoid of statistical background."[34] Fundamentally, Hacking saw a difference between what can be counted as probable, statistically speaking, and what can be thought probable, in an epistemological sense.

[32] Ibid., 538.

[33] Ian Hacking, *The Emergence of Probability* (Cambridge: Cambridge University Press, 1975), 13.
[34] Ibid., 12.

While certain events—such as births, deaths, and accidents—began to be counted, averaged, and, as a result, statistically quantified, other phenomena were only described through degrees of plausibility that did not correspond directly with discrete numbers, though they nevertheless communicated an idea of probability (e.g., a juridical conception of guilt or a medical diagnosis). Auerbach's description of realist and modernist verisimilitude corresponds with expressions of the aleatory and epistemic functions of probability, respectively, when understood as the likely similarity to truth defined objectively, according to some numerical metric available for social consensus, and truth defined subjectively, that is, a sense of likelihood sustained by an individual's changing apprehension of information: what can be counted as probable and what can be thought probable, but in literary form. The former is centrifugal, an outward push into the external reality of social interactions and events, facts and numbers, indexical reference points to be measured or identified, even counted; the latter is centripetal, an inward pull that draws the reader into the ostensibly unquantifiable interiority of human mind and experience, psychology and subjectivity. Hacking's model makes it possible to see how Auerbach required both a statistical concept of probability—the determination of likely or unlikely events—and an epistemological one—a subjective interpretation of randomness—in order to mediate between the logics of realist and modernist verisimilitude, showing them to be distinct yet related movements in a broader tradition of Western mimesis.

Of course, thinking about aesthetic verisimilitude in terms of probability can be traced as far back as Aristotle. In his *Poetics*, Aristotle made repeated assertions that the events of tragedy must play out according to "the laws of probability" and therefore limit the incorporation of chance.[35] Aristotle thus introduced the concept of chance as an aesthetic category, and

[35] Aristotle based his view of verisimilitude on a fundamental distinction between the general and the particular. According to this view, writers of history are free to write about chance events, because history

narratologists in particular have taken Aristotelian probability as the starting point for sweeping accounts of the historical vicissitudes that have altered the conceptualizations of chance in literary texts across the centuries.[36] But the concept of chance alone, without Hacking's more nuanced, two-fold analysis of probability, cannot explain how Auerbach's version of verisimilitude came to inform, even today, distinctions made between realism and modernism. As literary scholar Rüdiger Campe clarifies, Aristotle's emphasis on "the laws of probability" laid the groundwork for a modern association between verisimilitude and probability, particularly as such laws were formulated mathematically around the birth of the novel.[37] Campe shows that even as the novel emerged as a narrative presentation of events that—in Aristotle's terms—"happen" under "general" circumstances, mathematical probability emerged precisely as

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deals with "what has happened" in a particular case. The writer of tragedy, on the other hand, must avoid chance and accident so as to maintain a sense of "what may happen" under general circumstances (102). Though a modern definition of mathematical probability is anachronistic to Aristotle's meaning, the rendering of *eikos* as "probability" resolves, as one translator explains, "in the strict sense, a subjective and an objective side to the matter" (101). While Halliwell's comments do not specifically cite scholarship such as Hacking's on the modern meaning of probability, he clearly differentiates between the objective measurement of chance events and subjective feelings of plausibility. The latter is important to Aristotle's rhetorical theory, that is, probability as the art of convincingly persuading an audience of something as likely, while the objective definition of *eikos* becomes an element of plot, causality, and literary event that gets imported into definitions of realist verisimilitude. See *Aristotle's Poetics*, trans. Stephen Halliwell (Chicago: University of Chicago Press, 1998).

[36] Studies by Ross Hamilton, Brian Richardson, and Hilary Dannenberg examine the *long durée* of this correspondence to illustrate historical shifts in the theological, philosophical, and scientific meanings of chance as they shape narrative forms. See Ross Hamilton, *Accident: A Philosophical and Literary History (*Chicago: Chicago UP, 2007); Brian Richardson, *Unlikely Stories: Causality and the Nature of Modern Narrative* (Newark, Delaware UP: 1997); and Hilary P. Dannenberg, *Coincidence and Counterfactuality: Plotting Time and Space in Narrative Fiction* (Lincoln and London: University of Nebraska Press: 2008). For a period study that clarifies more specifically how chance intersects with literary forms prior to the novel see Michael Witmore, *Culture of Accidents: Unexpected Knowledges in Early Modern England* (Stanford: Stanford UP, 2002).

[37] Rüdiger Campe, *The Game of Probability: Literature and Calculation from Pascal to Kleist*, trans. Ellwood H. Wiggins, Jr. (Stanford: Stanford UP, 2012). Campe argues that a retreat from empiricism in late eighteenth-century society sparked both the emergence of classical probability and the birth of the novel.

the science of counting such events, particularly as they were discovered in games of chance.[38] According to Hacking, the rise of nineteenth-century statistics, the fullest realization of what he calls the aleatory function of probability, developed as a calculus to "tame chance," that is, to determine general laws of probability based on repeatable events; literary realism, at the same time, developed as the aesthetic form that most thoroughly codified statistical logic by also displaying a series of likely, though often accidental, events—a "form of strict liability," as Sandra Macpherson argues.[39] Realism is, to borrow Mark Seltzer's phrase, "the discourse of statistics."[40] Other studies of nineteenth-century literature underscore how the attachment of

[38] Hacking and Campe disagree on the degree to which the *Poetics* bore an influence on the emergence of both aesthetic verisimilitude and a probability calculus in the eighteenth century. From the outset, Hacking disregards Aristotle, whose writings originate too long before the emergence of modern probability, whereas Campe argues that the rediscovery of Aristotle by Enlightenment thinkers means that in its association of aesthetic truth with probable truth, the *Poetics* provided a framework by which novelistic verisimilitude, since its inception, was based on "laws of probability," even as such laws were being formalized mathematically. See Hacking, 17; Campe, 6. In the earliest studies of literary probability, Douglas Patey and Robert Newsome raise specific issues with the Hacking thesis. Patey, for example, offers instances of Renaissance-era probability as a prelude to the mathematical definition of probability. See Douglas Patey, *Probability and Literary Form: Philosophic Theory and Literary Practice in the Augustan Age* (Cambridge: Cambridge UP, 1984); and Robert Newsome, *A Likely Story: Play and Probability in Fiction* (New Brunswick: Rutgers UP, 1988).

[39] Building on his earlier study of probability, Hacking develops the thesis of nineteenth-century statistics and the conquest of natural contingency in *The Taming of Chance* (Cambridge: Cambridge UP, 1990). As Sandra Macpherson explains, the realist novel comprises a "form of strict liability," precisely because realist plots are structured by the kinds of accidents that liability laws emerged to count, quantify, and control. Sandra Macpherson, *Harm's Way: Tragic Responsibility and the Novel Form* (Baltimore: Johns Hopkins UP, 2010).

[40] When Seltzer describes literary realism and naturalism as "the discourse of statistics," he draws specifically from Hacking's emphasis on the aleatory function of probability, as have several other studies of late-nineteenth-century fiction. This is because aleatory or objective probability more or less means statistics, the invention of which triumphantly inundated nineteenth-century culture with "an avalanche of numbers," according to Hacking. In *The Taming of Chance* Hacking first outlined how the production of statistical averages abetted the biopolitical processes of what Foucault defined as normalization; literary scholars, as a result, show that statistical techniques also led to realism's portrayal of humanity as subject to the law of averages, what Mark Seltzer calls naturalism's making of "statistical persons" and what Audrey Jaffe has also explored as an economic preoccupation with averageness in Victorian novels. Maurice Lee also invokes the taming of chance when he writes that nineteenth-century literature codified the belief that "chance, long dismissed as a nominal concept marking the limits of human knowledge, came to be regarded as an actual force subject to degrees of human control." Mark Seltzer, *Bodies and*

realist verisimilitude to a statistical logic required realist novels to present random or accidental events in ways that revealed the social construction of chance.[41] Otherwise, as Catherine Gallagher explains, when realist events moved too close to the random and the particular, they were deemed, at the time, "manifestly improbable" and therefore aesthetically inferior.[42]

On the other hand, Auerbach's observation of a more subjective, non-statistical attention to "chance" affirms what literary scholars identify as paradigmatically modernist experiments: from the shocks experienced by the *flaneur* and Proust's *mémoire involuntaire*, to Benjamin's gambler and Stein's automatic typing.[43] This decidedly modernist investment in the

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Machines (New York: Routledge, 1992), 5; Audrey Jaffe, *The Affective Life of the Average Man: Victorian Novel and the Stock-Market Graph* (Columbus: Ohio State Press, 2010); Leland Monk, *Standard Deviations: Chance and the Modern British Novel* (Stanford: Stanford UP, 1994); Maurice Lee, *Uncertain Chances: Science, Skepticism, and Belief in Nineteenth-Century Literature* (Oxford: Oxford UP, 2012).

[41] In these accounts, chance is continually reinvented, for one reason or another, so that it can then be explained away as essential to the marching on of literary events and the discovery of natural truths, so-called "laws" of chance that, in this telling, are always incorporated back into realism's relentlessly active and external narrative drive. In the final chapter of *The Gold Standard and the Logic of Naturalism*, Walter Benn Michaels argues that all aesthetic appeals to chance end up certifying the humanist authority of intentionality. Similarly, Jason Puskar argues that a range of naturalist texts take advantage of the idea of chance as a common enemy to the American population to produce a political response that organizes the social world against the natural one. See Walter Benn Michaels, *The Gold Standard and the Logic of Naturalism* (Oakland: UC Press,1988); and Jason Puskar, *Accident Society: Fiction, Collectivity, and the Production of Chance* (Stanford: Stanford UP, 2012).

[42] In tracing what she calls the rise of fictionality, Gallagher provides several instances in which accusations of improbability structure debates about verisimilitude. See Catherine Gallagher, "The Rise of Fictionality" from *The Novel: Volume I* Ed. Franco Moretti (Princeton: Princeton UP, 2006): 338. Adam Grener explains this tendency as a paradox of realist form, in which chance both fundamentally structured realist texts and yet continued to be construed as opposed to Aristotelian aesthetics. Grener summarizes the strategies by which realism reconciles itself to quantifiable probability, devices that turn on narrative coincidences, chance encounters, and accidents of all kinds, as "realist techniques." Adam Grener, *Improbability, Chance, and the Nineteenth-Century Realist Novel* (Columbus: Ohio State UP, 2020).

[43] Scholars of modernism have acknowledged a variety of modernist investments in the randomness of internal consciousness, though such engagements often get interpreted as celebrations of either chance itself or the technologies that provided access to chance, rather than what Auerbach understood as appeals to a new kind of verisimilitude. For Gertrude Stein's experiments with automatic typing, which were meant to record the accidents of unconscious thought, see Friedrich Kittler, *Gramophone, Film, Typewriter*. Trans. Geoffrey Winthrop-Young and Michael Wutz. Stanford: Stanford UP, 1999 [1986]. For the crash as a modernist trope, central to figures such as Freud and Benjamin, see Karen Beckman,

psychological dimensions of probability can be summed up by the Symbolist motto of Mallarmé: "A throw of the dice will never abolish chance." More than simply celebrating chance itself, Mallarmé defied one logic of probability, based on quantifiable phenomena, in favor of another, in which phenomena cannot be quantified. Alluding to the scientific revolution that Hacking refers to as "the taming of chance," which began with the discovery of formal laws in games, Mallarmé's "throw of the die" linked modernism with the discovery of a kind of chance that, because it had not been "tamed," had not been "abolished." Indeed, even when modernist writers engaged with mathematics, they reinforced contemporaneous interests in infinity or imaginary numbers like π—those unquantifiables that modern mathematicians could no longer ignore.[44] Only with this history in mind can we appreciate Wimsatt's association of modernism with π. As the next section explains, the rise of digital machines entailed attempts to reconcile objective and subjective probability, to compute what had previously been deemed "uncomputable."[45] As such, we have yet to consider a parallel development with regard to literary form: the coming together of Auerbach's two versions of chance, what I call improbable realism.

Crash: Cinema and the Politics of Speed and Stasis. Durham: Duke UP, 2010. For a reading of modernist "shock," as it developed from the observational chance of the *flaneur* through to the technological accidents described by Beckman, see Enda Duffy, *The Speed Handbook: Velocity, Pleasure, Modernism*. 2009.

[44] On modernism's vested interests in the mathematically unquantifiable, see Tim Armstrong, "'A Transfinite Syntax': Modernism and Mathematics." *Affirmations: of the modern* 6.1 (2019), 1-29.

[45] While I discuss this phenomenon in more detail below, Alex Galloway has written that "part of the history of computation is the history of the uncomputable being colonized by the computable." Alex Galloway, "Uncomputer." *Culture and Communication* (blog), February 9, 2020. Accessed January 2021.

The Digital Aesthetic

Historians of technology often cite the landmark event of the digital age as the publication of Claude Shannon's "A Mathematical Theory of Language" (1948). Shannon formally quantified communication according to a statistical assessment of linguistic probabilities. As information increased, Shannon claimed, so did entropy, when measured as an additive inverse of probability. It is tempting to see in Shannon's theory of language the threat to reduce all linguistic content to mere "information," and thus a key historical explanation for the elevation of linguistic wordplay as modernism's most distinguishing characteristic. Indeed, the most enduring accounts by literary critics of the links between the digital and the literary begin with the premise that language is the chief site of disciplinary battles for cultural prominence after World War II.[46] In addition to a theory of language, however, Shannon's work on communication also demonstrated a particularly successful, because vastly applicable, new methodology of mathematical formalism, in which probability provides new entry points for quantification. While still a primary medium of literary expression, language is not the only formal aesthetic category that shares ground ceded to quantification. In other words, language was not the final frontier of quantification, but a testing ground for demonstrating a variety of new possible applications of math to social life. In an observation of the new methodological landscape of probability after World War II, structural anthropologist Claude Leví-Strauss described this set of phenomena as "the mathematics of man."[47]

The contours of a shift in the history of mathematics remain all but absent from literary

[46] Hayles's work, particularly *How We Became Postmodern*, remains a powerful account of literary history during the emergence of cybernetics, with the concept of information functioning as the standard bearer of how cybernetics wields aesthetic influence over postwar culture.

[47] Claude Leví-Strauss, "The Mathematics of Man." *UNESCO: International Social Science Bulletin* 6.4 (1954), 581 -590.

history, owing partially to confusion over its description, even among mathematicians.[48] The elision persists despite attention to the mathematical revolution that would culminate with the emergence of digital machines by an array of the era's most impressive intellectual figures: Warren Weaver declared the twentieth century the "reign of probability"[49]; Norbert Wiener began both his landmark *Cybernetics* (1948) and his popular *The Human Use of Human Beings* (1950) with an account of how probability functions as the axis between an old and new statistics; French émigré and intellectual Simone Weil assessed the decline of contemporary morality in an essay that explored how "probability" had "destroyed classical physics"[50]; and in a 1955 seminar, French psychoanalyst Jacques Lacan stated that "the notion of probability," even then leading to the construction of symbolic machines (i.e., computers), was also "reviving a set of problems" long "highlighted and occulted" in "the history of thought."[51] While the details of

[48] Historians of mathematics have described the end of the classical system and the shift towards modern mathematics with varying terminologies, including the decline of intuitionism or constructivism and the rise of formalism, symbolism, postulationism, structuralism, etc. José Ferreirós and J.J. Gray explain that, whatever we term it, modern mathematics did away with the idea that math is a set of truth claims descriptive of verifiable reality. "Such views," they write, "were hegemonic from the time of Plato and Euclid to the days of Kant and Gauss. However, the period 1830-1930 led to their abandonment" (12-13). Improbable realism thus emerged at the culminating point in mathematic history in which uncertainty replaced truth, and the establishment of formalist relations described by probability replaced objective proofs. See Ferreirós and Gray, "Introduction" in *The Architecture of Modern Mathematics: Essays in History and Philosophy* (Oxford: Oxford UP), 1-45.

[49] Warren Weaver, "The Reign of Probability." *Scientific Monthly* 31.5 (Nov. 1930), 457-466. Looking back at his declaration of "A Reign of Probability," Weaver wrote *Lady Luck: The Theory of Probability* in 1963 to more fully examine how probability had come into its fullest expression of possible applications. Weaver's anecdote that begins *Lady Luck* conveys the swift expansion of probability's purview. Weaver recalls Vannevar Bush inviting him to the Office of Scientific Research and Development, an event that would transition his thinking about probability from the quaint topic of the college mathematics courses he had been teaching to a compelling solution for the military's most pressing problems. Warren Weaver, *Lady Luck: The Theory of Probability* (New York: Dover, 1963): 11-12.

[50] Simone Weil, "Classical Science and After" from *On Science, Necessity, and the Love of God* Trans. and Ed. Richard Rees (London: Oxford UP, 1968), 31.

[51] Jacques Lacan, *The Seminar of Jacques Lacan: Book II* Ed. Jacque-Alain Miller. Trans. Sylvana Tomaselli (New York: Norton and Co.: 1988): 192.

these accounts varied, they all pointed to a fundamental distinction between an old statistical regime, rooted primarily in the objective pursuit of countable phenomena through assessments of large numbers, and a new "revolutionary mathematics," according to Justin Joque, that made subjective phenomena quantifiable by establishing the probable relations of formal systems—a merging of the two meanings of probability that had, for several centuries, remained distinct.[52]

This dissertation considers how that which Auerbach called "exterior turning points," all those births, deaths, and accidents that constituted the grounds of realist verisimilitude, found parallel in phenomena previously deemed too complex, multi-faceted, and subject to contingency for literary expression save through psychological interiority. Chapter one begins with the quantification of language, which Vladimir Nabokov linked to his campus novel's comedy of errors. From there, improbable realism develops alongside the quantification of other ostensibly interior human domains: religious belief takes the form of a cybernetic negotiation between character choice and authorial control in Flannery O'Connor and Patricia Highsmith; racial identity depends on Ralph Ellison's portrayal of statistical accidents; and political will bends to

[52] There are but a few critical accounts of this mathematical development. Justin Joque describes the ascendance of Bayesian probability theory alongside the emergence of algorithmic capitalism: "While the early and mid-twentieth century saw attempts to find an objective ground for statistics, over the last few decades this objective view of statistics has waned as proponents of Bayesian approaches have abandoned the objective terrain established by an ideal coin in favor of a subjective measure—one that starts its calculations with a guess and then persistently updates probabilities as new evidence is gathered" (7). Alain Desroseières stays even closer to Hacking's original terms, writing that the dual meanings of objective and subjective probability "did not come together until after the 1940s and 1950s," as part of the rise of "machine tabulation and, later, computer science" (13). Georgio Agamben describes the migration of statistical probability, in the form of mathematical formalism, from pure statistics and into a broad swath of social science and humanistic disciplines, as "the genealogical primacy of probability" (18). Media theorist Eric Hörl gives an expansive account of this history in his explanation of the emergence of communication. Though Hörl chooses to tell this history in terms of a division in mathematics between symbolic and intuitionist theories of number, he points out that this takeover of mathematical formalism in other disciplines begins with Boole's establishment of logic on the mathematics of probability. See Justin Joque, *Revolutionary Mathematics: Artificial Intelligence, Statistics, and the Logic of Capitalism* (Brooklyn: Verso Books, 2022); Alain Desroseières, *The Politics of Large Numbers: A History of Statistical Reasoning*, trans. Camille Nash (Cambridge: Harvard UP, 2002); Georgio Agamben, *What is Real?* trans. Lorenzo Chiesa (Stanford: Stanford UP, 2018); and Eric Hörl, *Sacred Channels: The Archaic Illusion of Communication* (Amsterdam: Amsterdam UP, 2018).

the play between machine prediction and heroic individualism in the writings of Eugene Burdick. Each chapter of this dissertation looks more closely at the specific disciplines of machine translation, cybernetics, racial demography, and political science to explain how the construal of previously unquantifiable human phenomena as sets of formal relations coincided with their externalization at the level of plot in a set of postwar novels. The novelists I consider incorporate certain socio-political elements associated with realist form only by experimenting with the probabilistic balance of literary events, the "mathematics of man" indeed. The following chapters endeavor to demonstrate that the inclusion of sociological themes doesn't simply motivate modernist experiments with plot. Rather, improbable realism, the aesthetic balancing of unlikely events, provides the mechanism by which these late modernist novels model social life—a more strident negotiation between realism and literary form than is currently available in post45 literary studies. Moreover, because this improbable realism developed alongside the same epistemological framework of quantifying the unquantifiable that led to the emergence of digital media, improbable realism designates an aesthetic protocol bound to digitality, or what this dissertation presents as a digital aesthetic. In a coda, finally, I speculate that the fiction of Thomas Pynchon marks not an end to improbable realism but a remarkable expansion of the formal strategies developed by Nabokov, O'Connor, Highsmith, Ellison, and Burdick to the point of rendering them unrecognizable.

CHAPTER 1: CRYPTOGRAPHIC READING: MACHINE TRANSLATION, THE NEW CRITICISM, AND NABOKOV'S *PNIN*

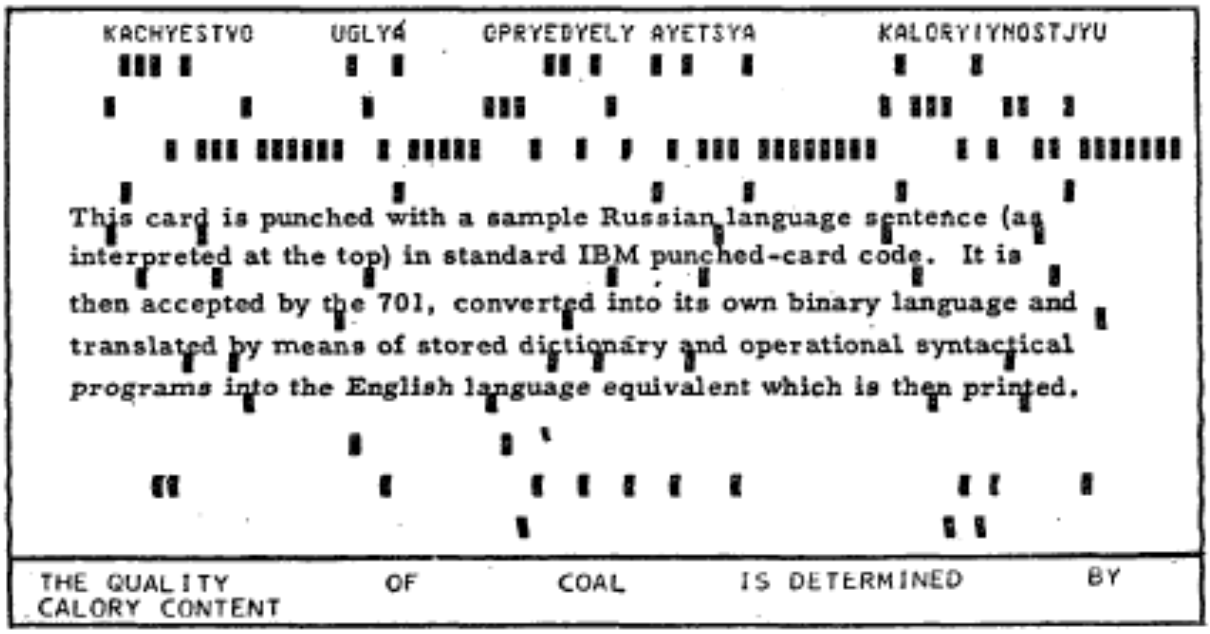

Figure 1: Sample punch card from the Georgetown demonstration. Source: Plumb, "Russian Is Turned into English."

Aesthetic Bliss

At the International Business Machines Corporation on January 7, 1954, a team of linguists and engineers from Georgetown University demonstrated the automatic translation of Russian into English with an IBM 701 digital machine. "Russian Is Turned Into English By a Fast Electronic Translator," the *New York Times* reported, calling the event "the first successful use of a machine to translate meaningful texts from one language to another."[53] The *Times* article

[53] Robert K. Plumb, "Russian Is Turned into English by a Fast Electronic Computer," *The New York Times*, January 8, 1954, 1.

was accompanied by a sample punch card, blown up and featured on the front page, with a line of Russian on one side and the corresponding English translation on the other (Figure 1). On computer punch cards, binary holes run vertically down the center, indicating the direction in which the card feeds into the machine. But to make the translated sentence legible for its readers, the *Times* printed the card horizontally, creating the illusion that the Russian words on top transformed into binary punches that then reassembled into an English translation on the bottom. The image conveyed the triumph of the event, described by the *Times* as the invention of a "mechanical model of language," the culmination of efforts to transpose human language into "a sequence of mathematical operations." The reporter pointed out that "a girl operator" who "did not know Russian" could feed the instructions to "an automatic digital computer."[54] The "Georgetown event," as the 1954 demonstration came to be known, was widely understood to confirm the idea that translation was no different than mathematics, and that mathematics was itself the "language" of new machines.

Just three years later, Russian émigré Vladimir Nabokov published a novel in which translation functions with decidedly less than mathematic precision, and in which translation emerges as crucially tied to gender, surfacing the questions that these "girl operators" inevitably raise. In *Pnin*, Russian language professor Timofey Pnin struggles to adjust his mother tongue to the masculinist communication channels—lecturing, teaching, administrating—through which academic information moves. Always engaged in the "complicated" "procedure" of making sense to his colleagues and students, Pnin "laboriously translate[s] his own Russian verbal flow . . . into patchy English."[55] The breakdowns in this process entertain Pnin's colleagues when he

[54] Ibid.; Robert K. Plumb, "Data for Electronic Computing Machines Are Prepared by Experts for Difficult Tasks," *The New York Times*, August 8, 1954, E9.

[55] Vladimir Nabokov, *Pnin* (New York: Vintage, 1957), 15. Subsequent references in parentheses.

hosts a party late in the novel. "His mispronounciations are mythopeic," one guest marvels. "His slips of the tongue are oracular. He calls my wife John" (165). The slippage from an original Russian "flow" to a "patchy English" output construes Pnin as a figure meant to oppose the idea of mechanical translation that IBM machines at the time promised. Though the guests are amused by, even enamored with, their Russian colleague's mistranslations, they express doubt about the future of Pnin's career. "The world wants a machine," says one guest, "not a Timofey" (161). Nabokov portrays his absent-minded professor as irrelevant in an age when machines do the work of translation. At the same time, however, linguistic errors provide the fodder for a poignant fictional characterization meant to endear readers to "poor Pnin." In sympathizing with a character identified by his "disarming old-fashioned charm" (10-11) and "uncontrollable smile" (13)—not to mention a name that sounds like "pain"—readers learn to love the Russian language professor who calls his house warming party a "house heating soiree" (151), and who laments, "I haf nofing left, nofing, nofing!" (61).[56] From one point of view, Nabokov humanizes translation in *Pnin* by recuperating the process from the cold mechanics of the Georgetown demonstration and invigorating it with the allure of a fictional character described as "almost feminine" (7). And as for mathematics: "'Eighteen, 19,' muttered Pnin. 'There is not great difference!'" (75).

Nabokov counters the mechanical reduction of language with Pnin, a fictional character

[56] The party scenes in *Pnin*, filled with jokes about the social gaffes of misremembering the names of others, may be Nabokov's cheeky parody of a similar scene that Roman Jakobson used to illustrate the mechanics of language. See *Fundamentals of Language* (The Hague: Mouton, 1956). In fact, my reading of Pnin as a probability machine navigating the social mores of academia resonates remarkably with Bernard Dionysius Geoghegan's explication of the Jakobson example: "Jakobson and Halle paint the scene of a New York party guest introduced to one 'Mr. Ditter.' Recognizing the name 'Mr. Ditter' becomes an instance of digital speech recognition . . . In lieu of positively identifying a meaning, the guest becomes an information system for the probabilistic correlation of the term with a database of possibilities. In the analyst's account, the guest searches for the correct identification of the uttered term, cycling through selections that include *bitter*, *dotter*, *digger*, and *ditty*." From Geoghegan, *Code* (Duke University Press, forthcoming).

whose botched translations convey linguistic complexity. After all, Pnin's errors are a way for Nabokov to display his wit, to exercise his artistic control over the nuance of the English language in the moments Pnin is seen charmingly stumbling over it. Nabokov exploits the coincidences of translation—e.g., Pnin and pain—for aesthetic effect. In fact, it is precisely through his pain, what manifests as a "seizure," that Pnin experiences the human excess of his difficulties with language (25). Nabokov moreover conveys this experience as a form of literary reading. Early in the novel, Pnin associates the onset of a seizure with "past occasions of similar discomfort and despair," and especially with the wallpaper from his childhood bedroom (21). The intricate design of the wallpaper had lead young Pnin to search for its meaning, and he "persevered in the struggle" to immerse himself in its "difficulties" (24). Though the precise significance of the wallpaper continues to elude him, Pnin's efforts are rewarded when he experiences an unanticipated secondary effect:

> The foliage and the flowers, with none of the intricacies of their warp disturbed, appeared to detach themselves in one undulating body from their pale-blue background which, in its turn, lost its papery flatness and dilated in depth till the spectator's heart almost burst in response to the expansion (24).

The impenetrability of the wallpaper overwhelms Pnin, and the "difficulty" gives way to euphoria. Thus, the passage allegorizes the reading of a literary text, from the bursting of the reader's heart to the "papery flatness" that such a vivid reality transcends.[57] Pnin's state of suffering bears out the feeling evoked by the autonomy of a work of art, a feeling Nabokov famously referred to as "aesthetic bliss."[58]

In spite of this allegorized, aesthetic scene of reading, Nabokov also portrays Pnin as

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[57] Gennady Barabtarlo views Pnin's wallpaper not only as an image of the novel itself, but calls its recurrence of patterns "the single most important and original feature" of "every Nabokov book." See Barabtarlo, *Phantom of Fact: A Guide to Nabokov's* Pnin (Fareham: Ardis, 1989), 79.

[58] Vladimir Nabokov, *Lolita* (New York: Vintage International, 1955), 315.

engaging is in a form of reading that is formally mathematic. From his bed, the feverish Pnin observes that the design of flowers and branches on his wallpaper is divided into two "planes," that each plane features the "repetition" of "elements" in a "series" to convey the illusion of a "rational pattern"; however, the failure on young Pnin's part to identify "what system . . . governed . . . the recurrence of the pattern" renders the wallpaper illegible, its coherency made "meaningless" by its unreadability (23). Aesthetically pleasing, the "system" of "patterns" also constitutes a formula that refuses to be solved. Pnin's struggle stems from his inability to reconcile the random "reappearance" of symbols, their "repetition" "here and there," with a coherent "recurrence" that would indicate a significance that structures the design. Are the repeated symbols on his wall the result of a random coincidence or an intentional pattern? What if they are both? What would it mean for "aesthetic bliss" to synonymously implicate something formulaic? After all, the wallpaper's mathematics are also the source of Pnin's aesthetic revelation, his affective response to its insolubility.

I will return to the question of how gender is implicated in this blurring of aesthetics and mathematics. For now, I want to draw attention to how coincidence and repetition, as established in the description of the wallpaper, finds concentrated expression in the figure of *Pnin*'s narrator, who describes himself as an "evil designer" of a "pattern" that haunts his protagonist, claiming he has "concealed the key of the pattern with such monstrous care" (23). The narrator's phrase, "the key of the pattern," raises the question of how Pnin's version of reading pertains to the act of deciphering a cryptogram, which begins with a linguistic key. The question is germane to Nabokov's cultural moment because of the work of U.S. chief cryptologist William F. Friedman, who proved mathematically that differentiating between random similarities and patterns of significant frequency enables the decoding of encrypted messages. In 1935, Friedman argued

that the meaning of a message can be determined by "a purely mathematical analysis" that he called "the index of coincidence."[59] By the 1950s, just when Nabokov was writing *Pnin*, Friedman's work helped motivate the construction of a mechanical model of language, including efforts in machine translation. Rereading *Pnin* in light of Friedman's influential work explains Nabokov's curious invention of a first-person omniscient narrator: when the narrator acts with the traditional objectivity of an omniscient narrator, the novel's coincidences look like the mere reporting of random phenomena—events as they truly happened; but when coincidences accrue, turning into patterns, they expose the narrator's conspicuous intentionality. Patterns indicate that events have been designed, not reported, for the purpose of storytelling. Furthermore, the combination of coincidences and patterns in *Pnin* signals to the reader, as it would a cryptographer, the possibility of decoding language for the purposes of narrative interpretation. Nabokov invents his first-person omniscient narrator, then, to construct a problem for the reader. To see through events as they are told and discover events as they happened requires a form of cryptographic reading that disambiguates coincidence from pattern. In what follows, I show that cryptographic reading in *Pnin* presents a narrative logic attuned to digital models of quantifying the unquantifiable.

To be certain, critical readers of *Pnin* have long undertaken methods of pattern recognition to understand the novel's narrator, occasionally using explicitly cryptographic terminology that appears encouraged by and perhaps even vital to the novel's formal problems.[60]

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[59] William F. Friedman, *The Index of Coincidence and its Applications in Cryptanalysis* (Washington: The United States Government Printing Office, 1935), 1.

[60] For example, scholars describe "the cryptographic character" of Nabokov's prose, "decode" his literary "ciphers," and identify *Pnin*'s "intricate play of patterns." See, respectively, William Rowe, "The Honesty of Nabokovian Deception" in *A Book of Things about Vladimir Nabokov*, ed. C. Poffer (Ann Arbor: Michigan UP, 1974): 185; John V. Hagopian, "Decoding 'Signs and Symbols'" in *Anatomy of a Short Story: Nabokov's Puzzles, Codes, and "Signs and Symbols,"* ed. Y. Leving (New York: Bloomsbury,

However, such cryptographic terms—patterns, cyphers, codes—have thus far been understood in Nabokov studies as mere metaphors. Through them, scholars reassert the aestheticism of Nabokov's modernist wordplay without acknowledging the historical conditions animating this language and, consequentially, the particular forces motivating his decision to tell the story of a language professor at a university campus. As a campus novel, *Pnin* emerges at the moment of the New Criticism's programmatic canonization of literary modernism and its prioritization of linguistic difficulty.[61] Yet the degree to which these developments correspond with the simultaneous arrival of mathematical theories of language in American universities has been obscured by the same failure to recognize that Pnin's wallpaper displays a form of modernist difficulty also construed as cryptographic.[62]

2012): 298; Julian W. Connolly, "Introduction: Nabokov at 100" in *Nabokov and his Fiction: New Perspectives*, ed. J. Connolly (Cambridge: Cambridge UP, 1999): 3. For other readings of *Pnin* derived from the identification of patterns, see Paul Grams, "*Pnin*: The Biographer as Meddler" in *A Book of Things about Vladimir Nabokov,"* ed. C. Proffer (Ann Arbor: Michigan UP, 1974): 192-201; David Richter, "*Pnin* and 'Signs and Symbols': Narrative Entrapment" in *Anatomy of a Short Story: Nabokov's Puzzles, Codes, and "Signs and Symbols,"* ed. Y. Leving (New York: Bloomsbury, 2012): 224-35; William Carroll, "*Pnin* and 'Signs and Symbols': Narrative Strategies" in *Anatomy of a Short Story: Nabokov's Puzzles, Codes, and "Signs and Symbols,"* ed. Y. Leving (New York: Bloomsbury, 2012): 236-50; Robert Alter, "Nabokov for Those Who Hate Him: The Curious Case of *Pnin*" in *Nabokov Upside Down*, ed. B. Boyd and M. Bozovic (Evanston: Northwestern UP, 2017): 197-209.

[61] On the "difficulty" of modernism, which the New Criticism made central to its development of a midcentury critical apparatus, see John Guillory, *Cultural Capital: The Problem of Literary Canon Formation* (Chicago: Chicago UP, 1993). Mark McGurl has shown that campus novels of the period, McGurl shows, tend to embroil the formal aspirations of literary craft with the technological objects of scientific application. McGurl calls this amalgamation "technomodernism." Because Nabokov "didn't quite get with the program," that is, because Nabokov foregrounds a "mystical submission to aesthetic authority," McGurl begins his analysis of technomodernism with John Barth's 1966 novel *Giles Goat-Boy*, not *Pnin*. One aim of this chapter is to show that the undocumented history of machine translation in *Pnin*, published nearly a decade before Barth's mock epic novel, unseats longstanding presumptions about Nabokov's modernism that have obscured the novel's later reception. McGurl, *The Program Era: Postwar Fiction and the Rise of Creative Writing* (Cambridge: Harvard UP, 2011), 5.

[62] Fredric Jameson, for example, insists that Nabokov's "late modernism" continues to reject "the experience of the machine." See Jameson, *Postmodernism, or the Cultural Logic of Late Capitalism* (Durham: Duke UP, 1991), 305. Jameson means to uphold modernists' "hostility to" technology, and to contrast that position with a contemporary "affirmation, when not an outright celebration of the market as such." But, as we shall see, Nabokov incorporates machine translation and its language technologies into

The phenomenon of machine translation thus informs my interpretation of a problem that has long occupied readers of *Pnin*. At the same time, the novel's formal contextualization of machine translation enables us to see the remarkable ways in which cryptographic reading permeates midcentury linguistic practices. Midcentury literary culture and early digital innovations like machine translation are understood to have inhabited distinct domains. But in what follows, I read the founding documents of machine translation alongside those of the New Criticism to argue that mathematic models of language and traditional close reading both developed through applications of cryptography to language.[63] Retracing this shared intellectual origin not only reveals *Pnin*'s contribution to the ascendant postwar aesthetic of improbable realism, it also clarifies how the gendering of labor that attended both fields gives expression to this aesthetic. To glean the irreducibly human message of *Pnin*, one must first learn to read like a

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the high modernist aesthetics of *Pnin*, suggesting that he belongs with "technomodernists" after all. Indeed, Duncan White argues that Nabokov negotiated "a problematic relationship of late modernist ideas of authenticity and autonomy with the pressures of the literary marketplace," and Stephen H. Blackwell has shown that scientific discourse influenced Nabokov's art. My reading of *Pnin* bears this out in relation to machine translation. See White, *Nabokov and his Books: Between Late Modernism and the Literary Marketplace* (Oxford: Oxford UP, 2017), 8; Blackwell, *The Quill and the Scalpel: Nabokov's Art and the Worlds of Science* (Columbus: OSU Press, 2009). Several studies lay the groundwork for this complex understanding of modernism in relation to machines. See Hugh Kenner, *The Mechanic Muse* (Oxford: Oxford UP, 1987); Mark Goble, *Beautiful Circuits: Modernism and the Mediated Life* (New York: Columbia UP: 2010); Tim Armstrong, *Modernism, Technology and the Body* (New York: Cambridge UP, 1998).

[63] As such, this chapter builds on recent work by Michael Gavin that argues for a conceptual link between computational linguistics and midcentury literary criticism. Gavin describes William Empson's theory of linguistic ambiguity as prefiguring later advances in vector semantics, thus highlighting the "automaticity" of close reading (643). The modeling of vector semantics becomes possible, as Gavin notes, only in subsequent iterations of machine translation, after technical advancements and the expansion of data corpora that address the multivalent complexities of language. My research instead concentrates on the initial moments wherein machine translators sought to reduce such complexities to a cryptographic code, a one-to-one ratio between two languages that nevertheless corresponds to New Critical forms of pattern recognition. In both cases, the statistical realization of language, long associated strictly with scientific endeavors, proves vital to the development of literary practice. See Gavin, "Vector Semantics, William Empson, and the Study of Ambiguity," *Critical Inquiry* 44 (Summer 2018): 641-673.

computer—a word that, like "typewriter" before it, signals "the convergence of a profession, a machine, and a sex."[64]

Probability Machines

One difficulty of reading *Pnin* stems from the first-person omniscient perspective of its narrator. *Pnin*'s narrator describes moments from which he is physically absent, exposing his unreliability through feigned omniscience. Pnin responds to the resulting discontinuities by calling the narrator a "dreadful inventor" (185). The narrator, in turn, suggests that Pnin is "reluctant" to "recognize his own past" (180). The difficulty for the reader, then, is that she receives information from a source that is challenged by the very information it has provided. That is, Pnin's complaints about invented information constitute part of the novel's content, that which has itself been invented. Thus, the reader can only identify evidence of events as they originally happened (Pnin's "own past") through the orchestration of events as they are told (by a "dreadful inventor"). The problem facing the reader appears as nothing less than the distance between story and narrative itself—what the Russian Formalists termed *fabula* and *sjužet*. Readers resemble young feverish Pnin, then, straining to read his wallpaper design, emotionally moved by its aesthetic construction, yet convinced that its true meaning has been deliberately hidden. In fact, Pnin's cry of "dreadful inventor" recalls the narrator's description of himself as an "evil designer," an assignation the narrator uses to describe his concealment of a cryptographic message ascertainable only through a "key" to the wallpaper's "pattern." Nabokov's separation of story and narrative, when understood in the terms offered by narrative

[64] Friedrich Kittler, *Gramophone, Film, Typewriter*, trans. Geoffrey Winthrop-Young and Michael Wutz (Stanford: Stanford UP, 1986), 183.

theory, formalizes the wallpaper's image of cryptographic reading, rendering its mathematical patterns in literary form.

In the very first chapter of the novel, Nabokov extends the cryptographic terms established by the wallpaper to a formal problem between story and narrative by staging a pointedly statistical contest between Pnin and the narrator. At first, it seems a coincidence of bad luck that Pnin takes the wrong train on his way to deliver a lecture to the Cremona Women's Club. Coincidence seems again to govern Pnin's world when he forgets his suitcase while transferring to a bus—and yet again when on the bus, he realizes he has swapped the lecture in his pocket with a student essay. As these "diabolical pitfalls" of "unpredictable America" accrue, what at first looked like the mere reportage of chance events instead comes to resemble a pattern, as if Pnin's misfortunes have been designed (13). We see this when, faced with the quandary of where to secure his lecture so as not to confuse it with other papers, Pnin "theoretically" calculates "the chances" of success according to every available "possibility" (16). Here, Pnin engages in a game of probability. Eliminating first one contingency and then another, he strives to single out the decision that will most likely lead to his success.

After narrowing his choices, he determines that if the lecture remained in his current pocket, "it was physically possible" to accidentally "dislodge" it while pulling out his wallet, which we are told contains "a letter he had written, with my help" (16). The interjection of a first-person pronoun here confirms for the reader the narrative presence of a "dreadful inventor." We understand that the ostensible coincidences of Pnin's bad luck instead constitute nonaccidental circumstances deliberately organized to turn Pnin's misfortunes into a comedy of errors. The narrator admits as much when, as the seizure begins to take hold of Pnin, the narrator reveals that "now . . . Pnin felt what he had felt already on August 10, 1942, and February 15 (his

birthday), 1937, and May 18, 1929, and July 4, 1920—that the repulsive automaton he lodged had developed a consciousness of its own and not only was grossly alive but was causing him pain and panic" (21). The familiarity of his pain, the fact that it comprises a lifelong pattern, a sequence of precise dates, allows Pnin to catch on to its mechanics, though not without first construing his body as a "repulsive automaton." There is no difference here between the body in pain, an image of human excess, and the body as machine, an image of Pnin's ability to calculate probability. Which is to say, it is in this form that Pnin combines all of his papers, "stuffed" into his pocket, "thus thwarting mischance by mathematical necessity" (26). Unlike the situation with his wallpaper, here, Pnin reads the chain of events successfully. He accurately translates the dreadful inventor's "mathematical" pattern into a meaningful message. When he stands before the Cremona Women's Club at the end of the chapter, lecture in hand, Pnin seems a more successful calculator of odds than the narrator—and the reader—who had bet on his failure. Thus, it is with this opening scene in mind that the narrator proclaims, "if the evil designer—the destroyer of minds, the friend of fever—had concealed the key of the pattern with such monstrous care, that key must be as precious as life itself" (23). The "key of the pattern" mentioned by the narrator here, or Pnin's own attempt elsewhere to read Pushkin's poetry as a "cryptogram" (68), indicate the debt Pnin's version of reading owes to cryptography.

At the time of Nabokov's writing, William F. Friedman served as chief cryptologist for the newly formed National Security Agency. Before the war, Friedman ushered cryptography into a new era through applications of mathematical pattern recognition to military communications, and his methods led to the successful decipherment of the Japanese cipher during World War II. Friedman presented his most significant contribution in a government publication titled *The Index of Coincidence and Its Applications in Cryptography* (1935), which

historian Ronald Clark calls "the foundation stone of the new cryptography."[65] In this work, Friedman fundamentally demonstrated how to align multiple strands of information presumably containing enciphered messages to mathematically distinguish between patterns that are merely coincidences—"brought about by chance superimposition"—and those that are "causally related" recurrences, which is to say, "the resultants of the encipherments of plain-text letters."[66] Friedman's theories revolutionized older methods that required expertise in multiple languages and a tremendous amount of guesswork. Using Friedman's methods, a single analyst working during World War II could crack a code mathematically, even without knowledge of the encrypted language. Friedman showed that languages adhere to certain laws of probability, a fact that reveals itself, in any language, through statistically significant repetitions. The trick entails isolating such repetitions from the insignificant coincidences that inevitably result, like the irregular repetitions on Pnin's wallpaper, recurring "here and there" in a random and "meaningless tangle."

These same cryptographic terms of pattern and coincidence proved instrumental in the 1950s in developing a theory of reading central to efforts in machine translation. Indeed, when Warren Weaver, the wartime director of the Rockefeller Foundation, wrote a memorandum that effectively launched machine translation in 1949, he wrote that he first conceived of the possibility of automatic translation when a "distinguished mathematician" developed a method of cryptography during the war that worked regardless of the language being decoded.[67] "[O]ne naturally wonders," Weaver wrote, "if the problem of translation could conceivably be treated as

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[65] Ronald Clark, *The Man Who Broke Purple* (Boston: Littlehampton Book Services, 1977), 77.

[66] Friedman, *The Index of Coincidence*, 11.

[67] Warren Weaver, "Translation" in *Machine Translation of Languages*, ed. W. N. Locke and A. D. Booth (Cambridge: MIT Press, 1955), 15.

a problem in cryptography." To illustrate, he continued, "When I look at an article in Russian I say: this is really written in English, but it has been coded in some strange symbols. I will now proceed to decode." Weaver called this conflation of different practices his "cryptographic-translation idea."[68] The mathematics of cryptography led Weaver to identify in language the possibility of a "code," a series of "strange symbols" that reduces different languages to the same essential foundations. Weaver saw the patterns calculated by cryptography as "invariant properties" that must be "independent of the language used."[69] Once machine translators developed the underlying mathematic logic of linguistic content, Weaver reasoned, the process could be automated. Translation would be the work of digital machines.[70]

Nabokov's writing of *Pnin*, then, overlapped with what was understood to be the "golden age" of machine translation, as cryptographers and translators collaborated to conceptualize language as an object of statistical analysis.[71] During this period, Nabokov also made substantial

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[68] Ibid., 18.

[69] Ibid., 16.

[70] Weaver's articulation of cryptographic patterns clearly reflects the influence of Freidman. Indeed, Weaver even enlisted Friedman as the government consultant for the Georgetown group that gave machine translation its first headlines. Highly skeptical of the new field, Friedman would later write, "I laughed from my first contact with MT to the very end." See Clark, *The Man Who Broke Purple*, 235.

[71] Brian Lennon writes that "the Georgetown demonstration clearly marked a surge forward . . . It was the beginning of a golden age for MT, defined by major international conferences, a critical mass of important publications, and (in the United States) easy access to generous government, military, and private funding even before the Sputnik crisis of 1957." See Lennon, "Machine Translation: A Tale of Two Cultures" in *A Companion to Translation Studies*, ed. S. Bermann and C. Porter (New York: Wiley, 2014), 140. Central to these developments was Roman Jakobson. Not only was his theory of linguistic phonemes routinely cited in machine translation publications, but Jakobson himself began collaborating with Weaver, and by 1950, the Rockefeller Foundation awarded Jakobson a large grant to research the statistical logic of linguistic structures, necessitating several trips to Russia. See Bernard Dionysus Geoghegan, "From Information Theory to French Theory: Jakobson, Lévi-Strauss, and the Cybernetic Apparatus," *Critical Inquiry* 38.1 (2011): 96-126. Nabokov references these trips in a letter to Jakobson that effectively ended their professional collaborations and personal friendship. "Frankly," Nabokov wrote, "I cannot stomach your little trips to totalitarian countries, even if these trips are prompted merely by scientific considerations." *Vladimir Nabokov: Selected Letters: 1940-1977*, ed. Dmitri Nabokov and

contributions to the study of translation.[72] In the essay "Problems of Translation," Nabokov argued for the "impossibility" of literary translation, due to the inimitable power of Pushkin's metered prose, which instead necessitates a mode of "literal" translation. With "absolute exactitude," Nabokov claimed, literal translation adheres to "the essential pattern of the text," that which can be "scientifically studied"; the translator preserves semantic meaning and simple meter without attempting to replicate the intricate and "untranslatable" nuances of "literary" language, such as "beautifully onomatopoeic alliterations."[73] Once again, the difference repeats the theme of pattern and coincidence, an analogue for the broader poles of quantifiability found throughout midcentury theories of language. Like *Pnin*'s wallpaper, Nabokov's essay identifies the "untranslatable" complexity of aesthetics and the "patterns" capable of being "scientifically studied" as the two forces that determine literary language. The idea would find its barest expression in the "Translator's Foreword" of Nabokov's translation of *Eugene Onegin*, a project he had begun with Roman Jakobson—a key proponent of machine translation—before severing ties with the linguist.[74] There, Nabokov declared a perfect translation that maintains rhyme and form as "mathematically impossible"; but as for the feat of rendering the basic meaning and

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Matthew J. Bruccoli (San Diego: Harcourt Brace, 1989), 216. The degree to which Nabokov's relationship with Jakobson shapes the derisive representation of linguistics in *Pnin* has never been considered, though Jakobson certainly offers a plausible link between machine translation and the references to linguistic machines in the novel.

[72] See Vladimir Nabokov, "On Translating 'Eugene Onegin,'" *The New Yorker*, January 8, 1955, 34; "Problems of Translation: 'Onegin' in English," *The Partisan Review*, Fall 1955, 496-512.

[73] Nabokov, "Problems of Translation," 512.

[74] For a more thorough analysis of Nabokov's theory of translation in conjunction with both his relationship to Jakobson and Jakobson's ties to machine translation see Sean DiLeonardi, "Nabokov and the Mathematics of Language" in *Nabokov et la Traduction* ed. J. Louison-Charles and S. Shvabrin (Arras: Artois Press Université, forthcoming).

order of words: “This a machine can do.”[75]

Only a few months after Nabokov’s publications on translation, Weaver penned a brief foreword to a collection of the most seminal publications in the field of machine translation. Titled “The New Tower,” the foreword begins: “We are told, by those who are sensitive to all the beauties of the Russian language, that it is completely futile to try to translate the poetry of Pushkin into any other language—futile not for a computer, but futile for the most able bilingual poet.”[76] All but naming outright the decade’s most able bilingual Russian poet and translator of Pushkin, Weaver aptly summarized Nabokov’s position on the futility of literary translation. Eschewing expectations of “elegance” and “style,” Weaver asserted his own objective of “literal” translation, adding, “Pushkin need not shudder.”[77] Like Nabokov, Weaver claimed to remove aesthetics from the primary goal of translation, and he clarified instead that machine translation will enable the practical exchange of information. At the same time, Weaver’s foreword clarified that Russian literature—and the mantel of untranslatability that Nabokov had granted it—had entered the discourse of postwar machine translation.

Well Wrought Urns and Punched Cards

Had it not emanated from a “dreadful automaton,” *Pnin*’s thematization of the wallpaper’s difficult yet beautiful aesthetics could be said to reinforce the reigning logic of literary criticism at the time. Not only did New Critics celebrate the irreducibly human category

[75] Vladimir Nabokov, “Translator’s Foreword” from *Eugene Onegin: A Poem in Verse by Aleksandr Pushkin*, translation by Vladimir Nabokov (Princeton: Princeton University Press, 1975), xxvii, xxvi.

[76] Warren Weaver, “The New Tower” in *Machine Translation of Languages*, ed. W. N. Locke and A. D. Booth (Cambridge: MIT Press, 1955), v.

[77] Ibid., vii.

of language by constructing the notion of literary difficulty, they often did so in opposition to modern science. Cleanth Brooks's *The Well Wrought Urn* (1947), for example, distinguishes the "paradox" of poetic language from the "naïveté" of "science" writ large, and specifically from Basic English, a system of universal signification that, according to Brooks, "treat[s] language like notation."[78] When Brooks wrote *The Well Wrought Urn*, Weaver had already recognized the contributions of Basic English to his own "cryptographic-translation idea."[79] Literary difficulty, then, opposed not only a vague notion of science, but the specific development of mathematical theories of language and their machines. Confronted by such a machine—an "enormous" IBM newly stationed at Vanderbilt University—Donald Davidson observed that "with inhuman noise and precision, the machine was sorting the cards."[80] The reduction of language to "notation" threatened the essence of humanist values for Brooks. For Davidson, mechanical language was out-and-out "inhuman." And as the arrival of such machines on university campuses allowed for the various early instances of the computational humanities, what we now call the digital humanities, the New Critics established their celebration of linguistic difficulty in opposition to them: in this telling, close and distant reading were thus separated from the beginning.[81]

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[78] Cleanth Brooks, *The Well Wrought Urn: Studies in the Structure of Poetry* (London: Harvest, 1949), 10. Brooks' comment refers specifically to Stuart Chase, who saw Basic English as evidence for the possibility of unimpeded scientific communication. See Stuart Chase, *The Tyranny of Words*, 6th ed. (London: Methuen, 1947).

[79] Basic English was formulated by I. A. Richards and C. K. Ogden. In his 1949 memorandum, Warren Weaver noted, "This must be very closely related to what Ogden and Richards have already done for English" ("Translation" 23). Rita Raley has expanded on this historical connection, concluding, "To suggest a link between Basic English and a mechanized English is not to speak of a philosophical relation between language and technology but of a practical and cultural-historical relation" (302). See Raley, "Machine Translation and Global English," *The Yale Journal of Criticism* 16.2 (2003), 302.

[80] Donald Davidson, "In Justice to so Fine a Country," *The Sewanee Review* 63 (Spring 1955): 144-5.

[81] Many histories of the digital humanities point to its beginnings with Father Roberto Busa, whose *Index Thomisticus* comprised an early work compiled, in part, by IBM machines. See, for example, Meredith Hindley, "The Rise of the Machines," *Humanities* 34.4 (2013). Recently, Rachel Sagner Buurma and

This association of New Criticism with anti-scientism, however, has obscured the ways in which the new cryptography influenced New Critical formalism, just as it had machine translation.[82] In fact, W. K. Wimsatt conferred with none other than William F. Friedman while researching for his article, "What Poe Knew About Cryptography" (1943). Remarkably, this meant that Wimsatt developed his theories of literature while gaining insight into cryptography from America's lead cryptologist and the author of *The Index of Coincidence*. Declassified archival documents reveal that Wimsatt and Friedman exchanged letters on the application of cryptography to literature from late in 1941 to the summer of 1943.[83] Though Friedman focused primarily on military forms of cryptographic communication, he considered cryptography's literary applications as well, publishing on literary subjects twice during his career: a 1936 article in *American Literature* that analyzed cryptography in Poe's "The Gold Bug" and a 1957 study

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Laura Heffernan have argued that it was Josephine Miles, not Busa, who inaugurated distant reading with her index of Dryden, which used a similar tabulation machine several years prior to Busa. See "Search and Replace: Josephine Miles and the Origins of Distant Reading," *Modernism/Modernity Print Plus* 3.1 (2018). Finally, in "A Genealogy of Distant Reading," Ted Underwood has distinguished between the digital humanities and non-machine distant reading, a methodology derived from social science practices in the humanities that predates digital technologies. Underwood's argument helpfully gestures toward the epistemological, rather than just material constituents of literary methodologies, but this undoing of conventional history arguably works both ways. The New Critics, in my telling, implicate aspects of digital cryptography into their method of close reading without recourse to actual digital machines. Ted Underwood, "A Genealogy of Distant Reading," *Digital Humanities Quarterly* 11.2 (2017).

[82] Arguing that the New Critics simultaneously borrowed from and condemned postwar sociological methodologies, Stephen Schryer provides an excellent summary of the New Critical tension between scientism and anti-scientism. Schryer, *Fantasies of the New Class: Ideologies of Professionalism in Post-World War II American Fiction* (New York: Columbia UP, 2011), 49.

[83] Correspondence between Friedman and Wimsatt occurred while Friedman was head of the U.S. Signals and Intelligence Service and was therefore classified until well after Friedman's retirement. See Letters to/from Professor Wimsatt, folder 367, William F. Friedman Collection of Official Papers, National Security Agency; and Letters from William Friedman, series IV, box 49, folder 98, Wimsatt (William Kurtz) Papers (MS 769), Manuscripts and Archives, Yale University Library.

with his colleague and spouse, Elizabeth Friedman, on Shakespearean cyphers.[84] Defending the very authenticity and reputation of Shakespeare, the Friedmans debunked longstanding rumors that the bard's works contain cryptograms that hide an alternative authorial identity. Friedman later lent his expertise to Wimsatt for his own article on Poe and cryptography. Following Friedman, Wimsatt argued that cryptography helped Poe design interpretive puzzles that his readers must solve, that cyphers are merely one type of Poe's literary "devices." Despite what Wimsatt saw as Poe's literary virtues, however, he found in Poe no great cryptographer, technically speaking. Using the information gleaned from his correspondence with Friedman, Wimsatt went so far as to identify mathematic errors in Poe's probability statements about language.[85] Having learned from the best in the field, Wimsatt portrayed himself as knowing more about the frequency patterns of language than Poe.

The influence of Friedman on Wimsatt's literary criticism is evident in "The Intentional Fallacy," which he famously coauthored with M. C. Beardsley in 1949.[86] In *The Index of Coincidence*, Friedman showed mathematically that the meaning of a message depends on the decoder's ability to distinguish coincidences "brought about by chance" from "causally related" statistical patterns. His argument applied to hidden messages in Shakespeare as much as it did to intercepted military transmissions. "The mathematical theory of probability," Friedman wrote, allows Shakespearean patterns to be "calculated exactly," rather than showing up "by

[84] See "Edgar Allan Poe, Cryptographer," *American Literature* 8.3 (1936): 266-280; William F. Friedman and Elizabeth S. Friedman, *The Shakespearean Ciphers Examined* (Cambridge: Cambridge University Press, 1957).

[85] W. K. Wimsatt, "What Poe Knew About Cryptography," *PMLA* 58.3 (1943): 772.

[86] W. K. Wimsatt and M. C. Beardsley, "The Intentional Fallacy," *The Sewanee Review* 54 (Summer 1946): 469-488.

accident."[87] In "The Intentional Fallacy," Wimsatt and Beardsley likewise argued that the literary work is not pulled "out of a hat," that it bears a "design" and a "plan," indeed, that it "does not come into existence by accident."[88] The well-worn argument in "The Intentional Fallacy," that biographical interpretations are diminished by their dependency on authorial intention, links the hunt for intention to random chance; the critic approaches literature "in the spirit of a man who would settle a bet."[89] Here, the authors describe literary criticism as the work of "a man"—which hardly seems surprising—but also a man who must reject the vagaries of chance. The "fallacy" in question doesn't describe intentionality *tout court*, but intentionality after the fact. In their own example, Wimsatt and Beardsley questioned whether a line from T. S. Eliot has been influenced by John Donne. While simply asking Eliot might provide empirical evidence of a sort, such a search for intentionality after the fact ultimately relies on the accidents of circumstance: that Eliot's answer today would be different from his answer tomorrow, that he would even remember the influence, that he might have "meant nothing at all." Against these chances, the authors felt safe to "weigh the probabilities" that a better method relies on the consistencies provided by close readings of the actual texts. "The Intentional Fallacy" suggests comparing Donne's language to Eliot's in order to identify any shared linguistic patterns, a mode of close reading that calculates the likelihood of their correspondence. Failing to find such consistencies, Wimsatt and Beardsley determined that the resemblance between Eliot and Donne is a

[87] Friedman, *Shakespearean Ciphers*, 21.

[88] Wimsatt, "The Intentional Fallacy," 469.

[89] Ibid., 487.

coincidence rather than a causal relation. Maintaining their rejection of chance, they affirmed that "[c]ritical inquiries are not settled by consulting the oracle."[90]

Wimsatt and Beardsley contended that the work of art "works," that is, like a "machine," one "demands that it work." They claimed that a poem's components must function together economically, free of irrelevancies like "'bugs' from machinery."[91] I want to suggest that their analogy is symptomatic of, rather than merely incidental to the cryptographic distinction between chance and pattern woven throughout "The Intentional Fallacy." Referring to the programming errors or jams of digital tabulators, Wimsatt and Beardsley compared the work of the critic to debugging a machine. The analogy suggests that when Brooks contrasted poetry to "notation," or when Davidson called IBMs "inhuman," they complained about technical objects because they too closely replicated the methods of pattern recognition carefully honed by literary critics. After all, "the world wants a machine," Pnin's colleagues insist, not an English professor. The conflation of close reading and pattern recognition in "The Intentional Fallacy" thus resonates with scenes of machinic interpretation in *Pnin*. When Pnin instructs his students to view Pushkin's poetry as a "cryptogram," or when he attempts to read the patterns on his wallpaper like an "automaton" engaged in probabilities, such moments codify a kind of digital hermeneutics, an act of reading cryptographically.

This explains why Robert Penn Warren would assert, as he did in 1958, that "the New Criticism" resembles a "gigantic IBM machine—i.e., the 'method'—into which deft fingers of filing clerks feed poems and plays and novels and stories, like punched cards."[92] Warren imagined a "fallible human machine," a close reader working in concert with punch card

[90] Ibid.

[91] Ibid., 469.

[92] Robert Penn Warren, *Selected Essays* (New York: Random House, 1958), xii.

technology; the "intelligence, tact, discipline, honesty, and sensitivity" of the one determines which informational patterns will be fed by "deft fingers" into the "systematic" workings of the other. Nabokov's novel advances a similar idea: Pnin holds onto his humanity, against the technological process translation had become, precisely because of what Warren claims as the exclusive provenance of humans, their fallibility. At the same time, however, New Critics showed that human usage of language, however flawed, depends on technical mechanics, and that the two are virtually inextricable. There can be no doubt, at least in Warren's metaphor, that literary criticism, no matter how mathematically precise its methods, depends on a human. "Someone has to punch the cards," Warren wrote. In the discourse of postwar communications, though, this equates the work of the literary critic with that of a "card-puncher," one whose sensitivity to patterns transforms the labor of reading into information fed into a "gigantic IBM machine." Close and distant reading, not so separate after all.

Jamming the Machine

In the first chapter of *Pnin*, Nabokov establishes the terms of coincidence and pattern as a theme, which he elaborates with his description of the wallpaper. He then transmutes them into a formal concern, one that structures the events of Pnin journeying to his lecture at the women's club. Pnin's contest with the narrator, his "thwarting mischance by mathematical necessity," takes advantage, then, of what machine translators imagined as the terms of linguistic probability. Only now, the oscillation between pattern and coincidence describes the probabilities not merely of language, but of the literary event. In particular, the novel's formalization of probability derives from a gap between events as they happened and events as they are told. The Cremona lecture exhibits the effects of a transition from one to the other. In

the story world of the novel, narration—the transition from *fabula* to *sjužet*—functions as a species of translation—the transition from a source language to a target language—which itself functions, according to midcentury theories of language, like cryptography—the transition from an encrypted cypher to a plain text message. Pnin's wallpaper, then, is more than a beautiful, though impossible, mathematical formula; it also offers an image of these variables, story and narrative, probability and improbability, as Nabokov imagines them conditioning the limits and possibilities of the novel's form.

The narrator draws attention to narrative limitation in his assertion, stated just as Pnin stands to deliver his unlikely lecture, that "doom should not jam" (25). He laments the short-circuiting of his careful building towards "doom," what he imagined as Pnin's failure, adding, "[t]he avalanche stopping in its tracks a few feet above the cowering village behaves not only unnaturally but unethically" (25-6). Improbability defies the laws that govern nature, like an "avalanche stopping in its tracks." But the narrator's complaint of an "ethical" infraction implies an agent of causality beyond pure chance. We are meant to understand, that is, that Nabokov himself has intervened, allowing Pnin to "thwart mischance by mathematical necessity," just as the narrator has deliberately shaped the events composing Pnin's story. If we understand such interventions to provide unlikely and external solutions to matters of literary plot, then they function as instances of a modern *deus ex machina*. When the narrator says "doom should not jam," his use of the word "jam" indicates the ironic condition of *deus ex machina*—an ancient literary device—in an aesthetic era increasingly identified by its tendency towards self-reflexivity. *Pnin* certainly exists on the horizon of what Mark McGurl calls "autopoetics" or, more extensively, what Mark Seltzer has elaborated as "the official world."[93] Both McGurl and

[93] Only in this case, the reflexivity of Nabokov's fiction stages, not the entire campus space nor a total social system, but a particular model of cryptographic reading emerging in American universities. See

Seltzer draw from the language of systems theory to describe reality's staging of its own conditions as exemplified by literary works. Systems theory takes the feedback loops of cybernetics to demonstrate how cultural forms emerging in what Seltzer calls the "systems epoch" engage in perpetual self-reference, the incorporation of an outside observer into a closed system. McGurl and Seltzer have each clarified how systems theory offers an apt model for describing literary texts in which the closed story world stages its own conditions of production, often through the inclusion of authorial presence.

Pnin, however, doubles its inclusion of an observer, first through the narrator's observation of Pnin and also through Nabokov's observation of the narrator—a true feedback loop. The irony of this device is captured by the narrator's sense of surprise, not once but twice, when he fails to anticipate the possibility of external manipulation, even as he manipulates, from the outside, the story of Pnin. The second instance occurs in the novel's final pages, when Nabokov rescues Pnin from a painful encounter with the narrator, this time displacing him from the novel altogether, an event the narrator calls a "miracle" (191). The repetition of the doubled intervention—Nabokov's scheming against the already scheming narrator—clarifies that the "miracle" and the "jam" are one and the same, that the god in the machine has become a programming error. That is, the analog and therefore uncomputable mystery of the classical *deus ex machina* now enters into a quantifiable calculus of probabilities. As Seltzer reminds us, "reflexivity today is cheap."[94] Which is to say, the self-referential tendency in contemporary fiction is commonplace—hence Seltzer's argument that we identify the moment as "a systems epoch." But even if the gods have always required a machine to mediate their entrance into

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McGurl, *The Program Era*; Mark Seltzer, *The Official World* (Durham: Duke Press, 2016); Mark Seltzer, "The Daily Planet," *Post45: Peer-Reviewed* (Dec. 2012).

[94] Mark Seltzer, "The Daily Planet."

creation, *Pnin*'s innovation is to double the phenomenon, confirming that now these machines are digital.

Fiction writers in the age of digital machines, therefore, are like the "information technicians" for whom, according to Friedrich Kittler, "jam" serves as "the keyword" for "modernity itself"; or, as Gilles Deleuze writes, in his famous articulation of the modern control society: "jamming" is the "passive danger" of a society dependent on computers.[95] The intentionally cybernetic language of Kittler and Deleuze designates modernity's order of technological control as precariously exposed to the inevitable malfunctions through which control diminishes. If postwar machines convey the modern impulse for control, then so do postwar novels. However, in the language of "The Intentional Fallacy," a "bug" in the poetic "machine" always refers back to a fallible inventor whose intentions remain present in the literary work, like original sin. The "bug" gives evidence of human error, and machines jam, not because of their imperfections, but because they run too perfectly. That is to say, unable to compute anything but perfect mathematics, a machine cannot extricate itself from a situation compromised by Warren's "fallible . . . card-puncher." Under the aegis of human error, the machine simply stops. Human error, then, holds a strange and unintentional power—a "passive danger," as Deleuze writes—in the digital world.

What I have been suggesting is that, through his own errors, Pnin wields this power. However, Pnin's mistakes in translation do not reiterate a narrative in which man triumphs over machine. Instead, they expose the dependencies each has for the other. After all, the same idiosyncrasies and habits that signal Pnin's humanity to the reader render him undesirable in the modern university language program. He is fired and replaced to consolidate a department

[95] Friedrich Kittler, "Signal-to-Noise Ratio" in *The Truth of the Technological World*, trans. Erik Butler (Stanford: Stanford UP, 2013), 175; Gilles Deleuze, "Postscript on the Societies of Control," *October* 59 (Winter 1992), 6.

administration who had come to "believe only in speech records and other mechanical devices" (143). When Pnin's colleagues announce that "[t]he world wants a machine, not a Timofey," the punch line—"not a Timofey"—gains its comedic purchase from the gap between Pnin's too human "personality" and the machine "the world wants," a gap remedied by the joke's flattening of its subject into merely "a" Timofey. The joke, that is, doubles as an act of narration and translation in its reduction of the person of Pnin to a mere version of himself.

The department's reference to a translation machine that might replace the language professor defines not simply a temporal or historical marker of the novel's relationship to a particular technological project, that is, machine translation; the comment more significantly encapsulates the larger questions of language, labor, and technology during the Cold War that my reading recovers.[96] These questions are echoed in the novel's vacillation between mechanical language, on one hand, and literary difficulty, on the other, as is apparent in a single, though lengthy, sentence that describes the intellectual culture of Pnin's language department. And here, we return to the question of gender evoked by the "girl operator" of the Georgetown event with which this chapter began:

> As a teacher, Pnin was far from being able to compete with those stupendous Russian ladies, scattered all over academic America, who, without having had any formal training at all, manage somehow, by dint of intuition, loquacity, and a kind of maternal bounce, to infuse a magic knowledge of their difficult and beautiful tongue into a group of innocent-eyed students in an atmosphere of Mother Volga songs, red caviar, and tea; nor did Pnin, as a teacher, ever presume to approach the lofty halls of modern scientific linguistics, that ascetic fraternity of phonemes, that temple wherein earnest young people are taught not the language itself, but the method of teaching others to teach that method; which method, like a waterfall splashing from rock to rock, ceases to be a medium of rational navigation but perhaps in some fabulous future may become instrumental in evolving esoteric dialects—Basic Basque and so forth—spoken only by certain elaborate machines (10).

[96] For *Pnin*'s contribution to the postwar campus novel's association with McCarthyism see Eric Naiman, "Nabokov's McCarthyisms: *Pnin* in *The Groves of Academe*," *Comparative Literature* 68.1 (2016), 79.

"As a teacher," Pnin is far from the "difficult" and "beautiful" of modernist aesthetics. Nabokov derides the difficult and beautiful as language "infused" with "magic knowledge," and laments that the mere effect of this academic skill amounts to silly affectations of culture—"tea," "caviar," and "songs." He opposes the diminished version of the poetic power of language to an "ascetic" utility of "modern scientific linguistics." Repeating the phrase with which the sentence begins, the narrator explains that "as a teacher," Pnin feels cut off from the "lofty halls" of linguistics, which exchanges "language itself" for a "fraternity of phonemes," or a mathematical system of linguistic parts. The scientific view of language boasts of a "method" that, the narrator imagines, construes languages like "Basic Basque" as "spoken only by certain elaborate machines." Here the narrator contrasts the language of machines with aesthetic expression, affirming a fundamental dichotomy in the era of "two cultures."[97] The gendered dimension of translation to which I have thus far only gestured is elucidated here: the "maternal bounce" and "Mother Volga songs" of aestheticism expresses a femininity that contrasts the cold, mechanical masculinity of linguistic "fraternity." The sentence reenacts the journey to the Cremona Women's Club, wherein Pnin encountered the "diabolical pitfalls" that lie between the space of the campus and the site of female intellectual labor at its periphery.

The general effect of this lengthy sentence works to oppose the curt language of machines with aesthetic expression, certainly. More significantly, though, the sentence conjoins them, in so much as Pnin cannot remain "far from" one domain without also "approaching" the other. That is, their instrumentalization of language, whether aesthetically or scientifically, confronts him in his university work, as indicated by the repetition of the phrase "as a teacher."

[97] In 1959, British scientist and novelist C. P. Snow famously described the "two cultures" that divided Western intellectual life into the sciences and the humanities. Snow first made his diagnosis in the 1959 Rede Lecture, published thereafter as *The Two Cultures and the Scientific Revolution* (Cambridge: Cambridge UP, 1959).

In the end, Pnin cannot divorce language from the attributes of difficulty or beauty, any more than he can those of the modern and scientific, for it is not an escape from either but their particular reconciliation that Pnin models. The sentence thus unites the masculine "scientific" and "modern" with the feminine "difficult and beautiful"—those two forces that permeate Pnin's attempt to read his wallpaper—by construing them as inextricably tethered together in the character of Pnin. The New Critical turn to cryptography thus appears as an effort to enforce a sense of literary criticism performed, as Wimsatt claimed, "in the spirit of a man," rather than with the "maternal bounce" of Pnin's "stupendous ladies," a distinction produced by the mechanical "fraternity" of digital machines. However, the irony of Warren's comment, that the postwar literary critic amounts to a kind of "card-puncher," is that at the time, most card punchers were women. The deliberately gendered divisions of Pnin's department, then, also serve to remind us that the advent of digital machines necessitated a largely unseen contingent of female labor that achieved the work of cohesion in which Pnin also engages. This is certainly true of the Georgetown demonstration, which the *New York Times* described as the combination of a "mechanical part of the translation system," the machine itself, and "a literary part of the system," the linguistic model of language, which clearly corresponds with those two factions of Pnin's department. But as we have seen, the *Times* also established that the two parts were conjoined or brought together by "a girl operator"—a transparently dismissive description—who punched the cards and fed them to the machine, thus introducing the "literary" to the "mechanical."[98] The female operator makes the work of translation possible, despite the fact that,

[98] Plumb, "Russian Is Turned Into English," 1. Wendy Hui Kyong Chun brilliantly articulates the organization of occluded female labor in midcentury computation when she describes a female programmer who mediates between a higher-ranking man and the actual machine. Chun, "On Software, or the Persistence of Visual Knowledge," *Grey Room* 18 (Winter 2004): 26-51. Relatedly, Mar Hicks argues that systematic gender discrimination leads to the demise of the large female contingent of

because "the operator did not know Russian," the words she types are, as the *Times* is keen to emphasize, "meaningless (to her)."[99]

Pnin may occupy the queer middle ground between "maternal" aestheticism and "fraternal" linguistics. He is, in the narrator's phrasing, "almost feminine." But in the paradox that pervades all contemporary systems of labor, Pnin also contributes, simultaneously, to those very dynamics of imbalance. His own method of translation places him at either end—the "mechanical" and the "literary"—of a system that features, in its middle, a denigrated female employee on whom Pnin's acts of translation depend. To produce his lecture, the very document that becomes, on the way to a women's club, the source of a game of chance, Pnin "laboriously translate[s] his own Russian verbal flow, teeming with idiomatic proverbs, into patchy English," at which point the work of revision falls onto a typist, "Dr. Hagen's secretary," who delivers to Pnin a typescript from which he "delete[s] the passages he [cannot] understand" (15). As Pnin translates once (for mechanics) and again (for meaning), the production of the lecture hinges on the secretary's labor in between. Indeed, in *Pnin*, translation is never the work of an actual machine, any more then it is a facile renunciation of mathematical theories of language. Rather, Nabokov presents translation as a problem of reconciling the human body, and not just male bodies, with technical processes, as expressed, for example, in the physiognomy of Pnin's mouth—"the larynx, the velum, the lips, the tongue"—which functions, in this fictional world, according to the basic mechanics of a machine, from the "motion" of its parts to its "production" of sound (66). At the birth pangs of the digital age, *Pnin* neither acquiesces to the hollow acceptance of quantification as the era's reigning epistemology, nor retreats, predictably, to

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computational labor, particularly in the UK context. Hicks, *Programmed Inequality: How Britain Discarded Women Technologists and Lost Its Edge in Computing* (Boston: MIT Press, 2017).

[99] Plumb, "Russian Is Turned Into English," 5.

modernist aesthetic autonomy. Instead, the novel reconciles science and art, exposing them as never having been separate.

CHAPTER 2: HIGHER MATHEMATICS: SWITCHBOX THINKING AND SPIRITUAL CATHARSIS IN O'CONNOR AND HIGHSMITH

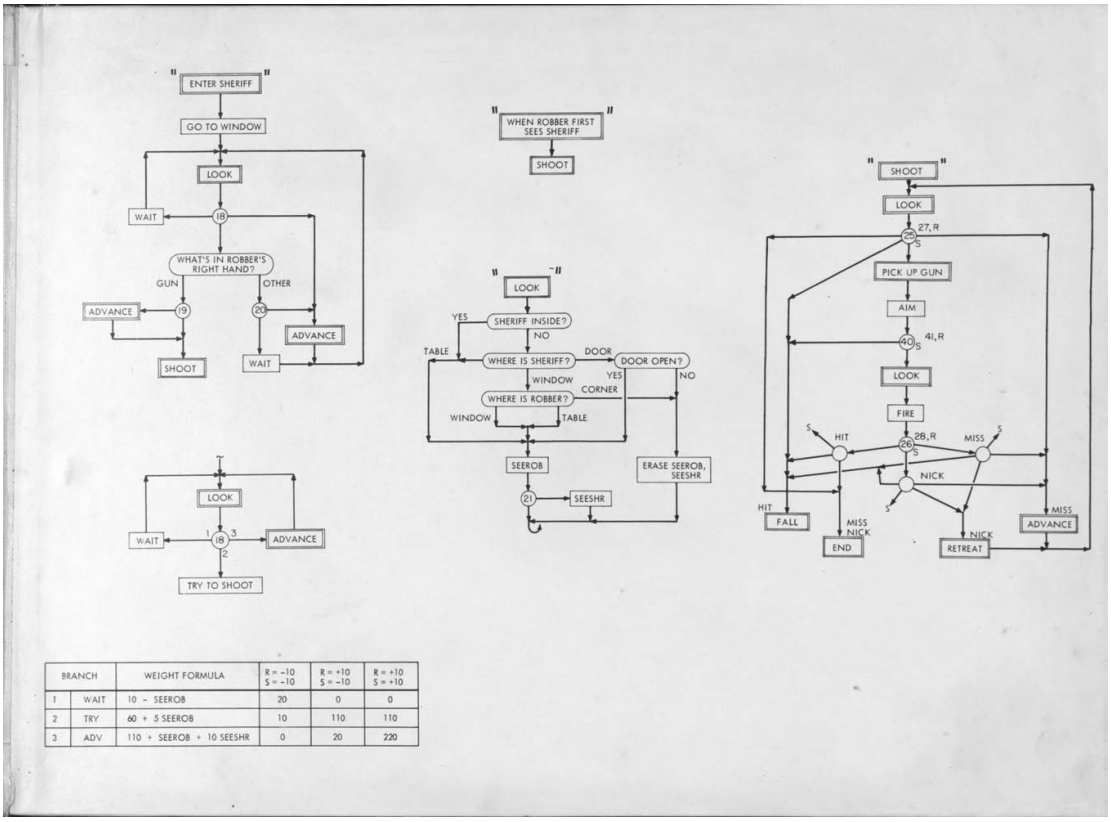

Figure 2: A flowchart of narrative events in SAGA, a computer program designed to generate fiction according to probabilities. Source: the Computer History Museum

Switchbox Thinking

The characters in Flannery O'Connor's *The Violent Bear It Away* (1960) often confuse their humanity with resistance to numbers. O'Connor's protagonist, Francis Tarwater, in particular, defends his irreducibly human freedom to act from the sociological abstractions of his schoolteacher uncle, who would rather calculate Tarwater's decisions and publish them in a

journal, thus turning, by extension, Tarwater himself into "a number." The novel's critique of the quantification of human life emerged from an author who complained at the time, "We are asked to form our consciences in the light of statistics, which is to establish the relative as absolute."[100] O'Connor's moral denunciation of statistics further indicated a problem for fiction, because, in her view, "There's a certain embarrassment about being a story-teller in times when stories are considered not quite as satisfying as statements and statements are considered not quite as satisfying as statistics."[101] O'Connor clearly believed that human beings, even fictional ones, are not reducible to numbers. It's all the more curious, then, when her characters render the human child at its center as an algebraic variable, claiming that "Bishop was an *x* signifying the general hideousness of fate . . . a simple equation."[102] That Tarwater should think in terms of "equations" and "numbers" recalls another literary protagonist from the era. In *Strangers on a Train* (1950), Patricia Highsmith's Guy Haines also worries that his diminishing ability to act is a problem of internal mathematics, as though "he couldn't make the equations balance."[103] Guy's loss of agency even leaves him feeling that "the best of himself" has been usurped by a "mechanical, absolute logic" (178). Consequentially, Tarwater and Guy appear to lose their humanity in the moments they mechanically adhere to mathematical "equations." And indeed, both novels trace the slow erosion of autonomy experienced by a character as he succumbs to an external will. The

[100] Flannery O'Connor, "The Fiction Writer and His Country" in *Mystery and Manners* ed. Sally Fitzgerald and Robert Fitzgerald (New York: Farrar, Straus and Giroux, 1970), 31.

[101] O'Connor frequently reworded her comparison of statistics to storytelling, resulting in numerous variations, some of which have been published in *Mystery and Manners*. This particular version comes from an unpublished talk titled "The Freak in Southern Fiction." See box 9, folder 35, Flannery O'Connor Collection, Series 2: "Writings," Stuart A. Rose Manuscript, Archives, and Rare Book Library, Emory University.

[102] Flannery O'Connor, *The Violent Bear It Away* (New York: Farrar, Straus, and Cudahy, 1960), 113. Subsequent references in parentheses.

[103] Patricia Highsmith, *Strangers on a Train* (New York: Norton, 1950), 272. Subsequent references in parentheses.

rub of such "simple equations," however, is that despite the automatic, even machine-like operations of problem solving, an unknown remains—a variable that codifies "the general hideousness of fate." Highsmith's portrayal of Guy failing to make "the equations balance" and O'Connor's abstraction of Bishop into an *x* ultimately enables both authors to preserve an ineffable mystery at the heart of their mechanical subjects. Highsmith and O'Connor clearly indicate that statistics may turn people into numbers; but according to their own fictional logic, novels can also turn numbers into people.

Strangers on a Train and *The Violent Bear It Away* depend on a similar fundamental premise to guide narrative action. In both novels, a character acts to avoid a future event explicitly communicated to him, and the reader, at the beginning of the narrative. When Highsmith's Guy Haines meets Charles Bruno on a train, Bruno makes the startling proposal to swap murders: "I kill your wife and you kill my father!" (34). Guy rejects Bruno's plan outright, and every subsequent action he takes means to specifically avoid the crime, even after Bruno holds up his end of the bargain. When Guy eventually submits to the plan, he conflates his own decision to commit murder with fate, asserting that "it had not been his will," but another, "working through him" (158). Tarwater's fate, with equal mysticism, is ordained by his great uncle, an "old man, who said he was a prophet" and who "calls" Tarwater to baptize his younger cousin, an endeavor in which his uncle had failed (5). Tarwater's refusal more violently illustrates the disparity between choice and fate that motivates action in both novels, when his attempt to murder his cousin—an act of utter defiance—turns out to fulfill the baptismal prophecy after all. Both Guy and Tarwater believe that murder exists for them as a choice, and in both cases they wield their decision to murder as a future they control. "I'm free," Tarwater frequently says, "I can act" (20, 80, 107). Likewise, Guy is "plagued by a feeling that he should

act," as though through action he might break the bond with Bruno (113). While chapter one looked at language as an impetus for postwar negotiations between the quantifiable and the unquantifiable, both in digital models of translatability and in Nabokov's narrative strategies, this chapter moves from language to thinking to ask how a similar negotiation authorizes O'Connor and Highsmith to elaborate a "mechanical, absolute logic," one deemed formally mathematic, that somehow allows both novels to conclude with improbable inversions of plot: inevitable deaths become spiritual births, predictable murders turn out to be baptisms, and higher orders of causality intervene.

For a novel to leverage a single outcome as motivation for all potential events is to indicate a homologous structure between the kind of thinking exhibited by fictional characters such as Guy and Tarwater, what this chapter refers to as switchbox thinking, and that advocated for and modeled by cybernetics, a contemporaneous scientific endeavor that demonstrated that "thinking and switching were inseparable."[104] Published in 1950 and 1960, respectively, *Strangers on a Train* and *The Violent Bear It Away* span a decade that witnessed broad interests in the possible mechanisms of human thinking, prompted particularly by the intellectual and institutional overlap of cybernetics and other disciplines such as psychology, psychoanalysis, and sociology.[105] Just as the machine translators discussed in chapter one digitally reduced language

[104] Eric Hörl, *Sacred Channels: The Archaic Illusion of Communication* (Amsterdam: Amsterdam UP, 2018), 289. Hörl captures the digitalization of thinking in the era of cybernetics when he writes: "Under the conditions of symbolic thinking in the age of cybernetic machines, talk of 'mind' could only mean an entity functioning in an essentially binary manner, and thinking could only appear as a question of binary encodings."

[105] On the institutional and theoretical links between cybernetics and midcentury sciences of the mind, including psychoanalysis, see Lydia H. Liu, *The Freudian Robot: Digital Media and the Future of the Unconscious* (Chicago: Chicago UP, 2010) and Bernard Dionysius Geoghegan, *Code: From Information Theory to French Theory* (Durham: Duke UP, forthcoming). Steve Heims even argues that cybernetics constructed the midcentury apparatus necessary for the American postwar social sciences to emerge as we know them. Steve Heims, *Constructing a Social Science for Postwar America: The Cybernetics Group, 1946-1953* (Cambridge: MIT Press, 1993).

to conform to binary mathematics, cyberneticians argued that human brains, like digital machines, depended on "all-or-none" firings of individual neurons.[106] Such assertions amplify the "simple equation" that O'Connor describes in her novel as "an *x* signifying the general hideousness of fate." If "fate" is merely an algebraic variable, then its calculation requires a switch point, a yes/no threshold that measures mathematical certainty (1 or 0) as the differential between any given action and the event a character seeks to elude. In other words, every moment comprises a binary step, an event that moves either closer to or further from a predetermined end designed by an author in advance. In O'Connor's equation, this differential is symbolized—formally, not figuratively—by the variable *x*. Highsmith captures the technological essence of a similar expression of causality when Bruno scoffs at his father's business empire: "The machine age! . . . Ever hear of the Bruno Transforming Company of Long Island? Makes AC-DC gadgets?" (20). Switchbox thinking in Highsmith's novel indicates that Guy, even when resisting fate, inevitably marches towards the murder that, because it defines Highsmith's novel as detective fiction, absolutely must occur.[107] A character's decision thus works like one of the Bruno family transformers, devices used to regulate electric power by switching between direct and alternating currents or greater and lesser sources of energy. Switch points are literally the nodes of an electric grid, and in *The Violent Bear It Away*, a similar image describes Rayber,

[106] Warren McCulloch and Walter Pitts, "A Logical Calculus of the Ideas Immanent in Nervous Activity" *Bulletin of Mathematical Biophysics* 5.4 (1943): 115-133. The Pitts-McCulloch model imagined brains as neurological switching-stations and became a foundational concept for the emergence of a cybernetic understanding of thinking. See Katherine N. Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: Chicago UP, 1999), 57-63.

[107] In this sense, I am drawing from work on the logic of switching in Highsmith's fiction by Michael Trask and Mark Seltzer. However, while both scholars have articulated "switch-points" as the mediation of representation and reality in Highsmith's novels, I am arguing for a more formal appreciation of how this logic is enacted at the level of plot. See Trask, "Patricia Highsmith's Method" *American Literary History* 22.3 (Fall 2010): 584-614; Seltzer, "Parlor Games: The Apriorization of Media" *Critical Inquiry* 36.1 (2009): 100-133.

Tarwater's schoolteacher uncle, who O'Connor construes as "something human trapped in a switch box" (154). In both novels, switches enforce the logic that structures narrative development according to a binary function. "The way I see it," Tarwater rationalizes, "you can do one of two things. One of them, not both. Nobody can do both of two things without straining themselves. You can do one thing or you can do the opposite" (39); or as Guy reasons, the "greatest wisdom in the world" is that "everything has its opposite close behind it" (208). Switchbox thinking therefore designates the formal logic of internal processing that gives the appearance of characters thinking, as well as the rippling effects that occur on the external level of plot; the result, either way, is that Guy and Tarwater appear as "something human trapped in a switch box." But what if O'Connor's description, rather than simply condemn technology as a dehumanizing force, also emphasizes her ability to produce "something human" while working within the rigid confines of the switchbox?

The fact that Guy and Tarwater both eventually enact precisely what they had attempted to avoid grants both novels an ostensibly tragic, even Oedipal ethos in which man is deterministically subjected to the will of the gods. Indeed, media theorists in particular have taken the cybernetic association of human thinking with machine protocol, a view that all but limits human cognition to an enormous though fully computable number of all-or-none switches, as the historical sign of increasing degrees of social, political, and technological determinism.[108] Friedrich Kittler, for his part, captured this sense of the dawning computer age when he quipped

[108] Guiles Deleuze's elaboration of a control society, precipitated especially by the advent of the computer, paradigmatically aligned the more technocratic impulses of cybernetics and information theory with an extension of biopolitical governmentality into more fully developed systems of surveillance and control. Gilles Deleuze, "Postscript on the Societies of Control," *October* 59 (Winter 1992), 3-7. More recently, in *What Algorithms Want*, Ed Finn writes that cybernetics fused probability theory with technologies of prediction in an effort "to build the best model, the finest simulation of reality's complex probabilistic processes," which appear to "effect procedural alterations to reality" (30, 2). Ed Finn, *What Algorithms Want* (Cambridge: MIT Press, 2017).

that, in postwar society, "only what can be configured as a switching circuit exists."[109] But as the following sections clarify, for Highsmith and O'Connor, switchbox models of causality signal more than the bankruptcy of human autonomy in an era of statistical control. In these novels, switchbox thinking inexplicably leads to spiritual catharsis, a remarkable literary anticipation of later attempts to bridge midcentury cybernetics and spirituality.[110] The electric infrastructure produced by Bruno's family, for example, resembles the modern icon evoked by the novel's title: the network of railways, also managed by switching stations, that brings Guy and Bruno together by chance. The remarkable event of their meeting accidentally, despite the train's switch-based, mechanical mode of transportation, exemplifies from the beginning what can only be described as the statistical mystery at the heart of these novels: that fictional characters should appear to make choices that coincide with the opposite of their intentions. In other words, the chance encounter, the miracle, and the spiritual conversion—such events do not exceed the logic of switching systems in these novels, but derive from it.[111] By switching murders into baptisms,

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[109] Translated from "Weil nur ist, was schaltbar ist," by Seb Franklin in *Control: Digitality as Cultural Logic* (Cambridge: MIT Press, 2015), 123.

[110] This chapter suggests that these literary artefacts prefigure the intersection of cybernetics and spirituality that Norbert Wiener wouldn't address until 1964 and which concerned much of the writings of Gregory Bateson in the 1970s, beginning with *Steps to an Ecology of Mind* (1972). R. John Williams calls the conflation of cybernetic ideas and spiritual praxis "technē-Zen," and has shown how it came to define later, more avant-garde—and more masculine, I might add—developments within midcentury countercultures. See Norbert Wiener, *God & Golem, Inc.: A Comment on Certain Points where Cybernetics Impinges on Religion* (Cambridge: M.I.T. Press, 1964); Gregory Bateson, *Steps to an Ecology of Mind* (Chicago: University of Chicago Press, 1972); R. John Williams, "*Technē-Zen* and the Spiritual Quality of Global Capitalism," *Critical Inquiry* 37 (Autumn 2011): 17-70.

[111] For our reading of novels from the period, this means adjusting our understanding of the theological work performed by contemporary literature. What Amy Hungerford calls "belief without content," and what John McClure identifies as "postsecularism," both explain postmodern fiction's spiritual faith in its own formal inventions. Highsmith and O'Connor surely turn secular doubt into literary faith, but they do not preserve the holy category of the novel to argue that words accomplish something that numbers cannot. See Amy Hungerford, *Postmodern Belief: American Literature and Religion since 1960* (Princeton: Princeton UP, 2010); John McClure, *Partial Faiths: Postsecular Fiction in the Age of Pynchon and Morrison* (Athens: University of Georgia Press, 2007).

O'Connor and Highsmith mobilize fictional strategies that we might nominate as "higher mathematics," that is, formal protocol in which switchbox thinking paradoxically leads characters to spiritual freedom and character choice coincides with authorial design.[112] Higher mathematics thus serve as another literary strategy, like cryptographic reading, of formally quantifying the unquantifiable through the improbable dynamics of plot. More specifically, they hypothesize an answer to the question posed in *The Phenomenon of Man* (1955)—which O'Connor claimed as the most important book of the midcentury—when Pierre Teilhard de Chardin asked, "How can life respect determinism on the *without* and yet act in freedom *within*?"[113] Just as the Jesuit paleontologist combined mystical theology and mathematics to wonder at processes in which "the laws of statistics" are coextensive with "the leap into the

[112] This phrase is written on the cover of a notebook in O'Connor's archives, ostensibly purchased and titled for a college course in Higher Mathematics, which O'Connor instead repurposed as a prayer journal. Because "higher" had only recently come to mean the branches of mathematics associated with algebra, calculus, but also probability theory, and because O'Connor ironically repurposed the journal's title to refer to a divine formalism—a communicative relationship between a supplicant and her God—it succinctly captures the metaphorical and spiritual capacities that mathematical thinking provided the novels under discussion here. See box 13, folder 10, Flannery O'Connor Collection, Series 3: "Personal Papers," Stuart A. Rose Manuscript, Archives, and Rare Book Library, Emory University.

[113] Pierre Teilhard de Chardin, *The Phenomenon of Man* (New York: Harper and Row, 1975 [1959]), 57. Robert Giroux introduced O'Connor to Teilhard de Chardin's writings in 1959, as she was completing her novel. Biographer Brad Gooch reports that when *American Scholar* polled leading authors on the most important books published between 1931 and 1961, O'Connor selected *The Phenomenon of Man*. See Brad Gooch, *Flannery: The Life of Flannery O'Connor* (New York: Back Bay Books, 2010), 322-331. Teilhard de Chardin sought to bring mathematics to bear on evolutionary biology in order to remove its apparent contradictions with Catholic dogma. Evolution, he claims, is a process of "determinate quantitative rules" in which probability, which he associates with entropy or the tendency towards sameness, also produces its own improbabilities, changes that allow the cycle to repeat but at a higher level of complexity (50, 52). There is much more than can be said here that suggests a counterpoint to the tendency in O'Connor studies to limit Teilhard de Chardin's influence on O'Connor to his text *The Divine Milieu*, despite the fact that the title *Everything That Rises Must Converge* is drawn from *The Phenomenon of Man*. These accounts overemphasize a biographical link between Teilhard de Chardin's writings on passivity and O'Connor's growing acceptance of lupus and its effects on her body, ignoring the equal importance of agency and individual will—"the leap into the improbable"—better articulated in *The Phenomenon of Man*. See Steven R. Watkins, *Flannery O'Connor and Teilhard de Chardin* (New York: Peter Lang Inc., 2009); James Grimshaw, *The Flannery O'Connor Companion* (New York: Westport Greenwood Press, 1981); Kathleen Spaltro, "When We Dead Awaken: Flannery O'Connor's Debt to Lupus" *Flannery O'Connor Bulletin* 20 (1991): 33-44; Ralph Wood, *Flannery O'Connor and the Christ-Haunted South* (Grand Rapids: William B. Berdmans Publishing, 2004).

improbable," these authors answer the question by producing stories that showcase their own mechanical processes in order to present their remarkable conclusions as all the more remarkable.[114]

Words that Count

In *The Violent Bear It Away*, Tarwater's mode of thinking is most readily emblematized by the machine that enables his uncle Rayber to hear. Rayber is partially deaf, having been shot by the old man while attempting to rescue Tarwater from a life of religious fanaticism. Rayber's hearing aid at first appears to Tarwater as a machine attached with Gothic freakishness to a human head. "What you wired for?" the boy asks, "Does your head light up?" (103). "His uncle's face," Tarwater thinks, "might have been only an appendage to it" (104). But the hearing aid also animates a conception of mechanical thinking, an image of decision-making attached to the operations of a "switch box": "'Do you think in the box,' he asked, 'or do you think in your head?'" (105). Tarwater fears Rayber's hearing aid, not merely because he believes that his uncle's "head ran by electricity," but because he remembers his great uncle's warning that the schoolteacher desired to "get everything inside his head and grind it to nothing" (105, 76). The thought causes Tarwater to insist, time and again, that he is "free": "I'm outside your head. I ain't in it" (111). Tarwater, moreover, imagines his uncle's hearing aid as the sign of a statistical machine, that "in the schoolteacher's head, he would be laid out in parts and numbers" (18). Indeed, Tarwater believes that "every living thing that passed through [Rayber's] eyes into his head was turned by his brain into a book or a paper or a chart," abstractions of meaning that produce only "dead words" (19); or as his great uncle admonishes Rayber, "Yours not to grind

[114] Ibid, 89, 271.

the Lord into your head and spit out a number!" (34). The hearing aid turns everything—"charts," "parts," "numbers"—into information, nothing but "dead words." O'Connor thus construes the assemblage of man and electric box as a computer: a horrible information-processing machine.[115]

O'Connor adapted her novel from the short story "The River," in which a boy confuses a minister's promise "to count," to be accepted as one of the denizens of heaven, with his earthly desire to be accounted for, that is, to be given the same consideration by his parents as they give to counting money when the story begins.[116] In the earlier story, O'Connor suggested, perhaps as we might expect, that the price of conflating these modes of counting was death. In the novel, however, this wordplay establishes Tarwater's conflict, as he instead learns that counting and being counted, acceptance and enumeration, go hand in hand. Tarwater flees the country, where his great uncle claims he has been "chosen," singled out "from the herd," "one among many" (18); and he travels to the city, where another uncle, Rayber, a schoolteacher and aspiring social scientist, counts only what can be assimilated into types, individual tally marks adding up to statistical trends. While seemingly opposed, each uncle counts to support a contradiction that confuses individuality and collectivity: in the country, the messianic singularity of being "chosen" means sacrificing one's autonomy to divine authority; in the city, the statistical

[115] In the only extant draft of the novel, O'Connor more clearly construed Rayber's hearing aid as a computer. Rayber, she wrote, "flicked a switch on the box and at once his face appeared to come alive," and the switch sets his eyes spinning like reels of magnetic tape, "two highspeed metal disks spinning so fast they appeared absolutely still." See box 9, folder 4, Flannery O'Connor Collection, Series 2: "Writings," Stuart A. Rose Manuscript, Archives, and Rare Book Library, Emory University. The specificity of the computer is perhaps even more apparent in a similar analogy, from a story published the same year as *The Violent Bear It Away*. That O'Connor was thinking of thinking in digital terms is clear in her description in "The Comforts of Home," of "the sheriff's brain," which "worked instantly like a calculating machine." See Flannery O'Connor, *The Complete Stories* (New York: Farrar, Straus, and Giroux, 2007), 404.

[116] Flannery O'Connor, *The Complete Stories*, 157-173.

evaluation of collective behavior leads Rayber to an enlightened belief in self-reliance. “I only meant you had the choice,” he tells the boy, “I want you to see the choice. I want you to make the choice . . . What we understand, we can control” (194). Modes of counting, and the questions of agency and belonging that become wrapped up in them, express Tarwater’s existential doubt. “Maybe,” he thinks, his uncles have “taught [him] a system of figures nobody else uses? How do you know that two added to two makes four? Four added to four makes eight?” (46). Counting numerically and counting collectively are thus conjoined: if he uses “a system of figures nobody else uses,” then he is left counting alone.

When Tarwater murders his cousin, the crime undoubtedly reflects the active choice of an individual. “I only meant to drown him,” he claims (209). Moreover, the logic Tarwater employs to make this decision depends on a switch: “You can do one thing or you can do the opposite.” Tarwater murders his cousin because it marks his decisive refusal to baptize his cousin, according to the mechanical logic that imagines freedom as a choice between opposites. Yet it is precisely the mechanicity of his behavior that allows O’Connor to implement the miracle that serves as the novel’s climax. During the act of murder, Tarwater finds himself “entirely out of control” of his “voice” (208); with the same freedom displayed by his automatic actions, he utters the words of the holy rite, baptizing his cousin unintentionally. The switch between murder and baptism collapses; the two become one. Tarwater insists that the coincidence—the simultaneity of the drowning and the baptism—is an “accident”: “They were just some words that run out of my mouth and spilled in the water,” “an accident and nothing more” (209, 221). He assumes, in other words, that words without intention are “dead words,” like the charts, numbers, and data that fill his uncle’s head. By demanding to retain his agency, however, Tarwater reinforces words with actions: “He had not said NO, he had done it” (221). As readers,

we understand this miracle as the simultaneity of Tarwater's sense of agency—which grants his fictionality a more human appearance—and O'Connor's own aesthetic agenda, which required Tarwater to commit an act he seemed unlikely to commit. As with the baptism and the murder, the distinction between these competing senses of authority is made synonymous. Not only does Tarwater's machine-like automaticity produce an encounter with the divine, figured here as the power of O'Connor's linguistic authority, that is, her power over language, but higher mathematics also enable switchbox thinking to produce words that are not dead but mean something. They become words that count.

It is only after the baptism that Tarwater discovers another "system of figures," one even emptier than those shown to him by his uncles. Hitching a ride back to the country, Tarwater is drugged by the driver and, in his disorientation, begins counting the trees that pass by: "one, one, one" until everything "began to merge and flow together" (230). Caught in a tautological series, Tarwater experiences absolute isolation as he is left counting alone. In this moment, O'Connor emphasizes what Highsmith's novel will help us clarify more thoroughly in the next section, that is, that the impasse between the mechanical and the spiritual had not been their incompatibility—which was overcome by a mere plot twist, a narrative miracle—but Tarwater's overwrought sense of masculinity. Tarwater's drug-induced counting occurs next to the driver of the car, a "dandy" who drugs Tarwater and rapes him, before leaving him in the woods. From her description of his "lavender" shirt to "the cigaret [sic] that hung limply from one side of his mouth," O'Connor clearly construes the dandy as effeminate (227). Yet the figure of the dandy troubles the advice conveyed to Tarwater throughout the novel by an internal voice the novel calls "his friend," but which is meant by O'Connor to indicate a demonic influence: "Be a man, his friend counseled, be a man" (215). The rape dismantles the false opposition between

masculine action and feminine inaction, communicated to Tarwater through the idea that to assert authority is to "be a man." This undoing is further signaled by O'Connor's syntactical switch to the passive voice, itself a mode of action that avoids agency. When he awakes, Tarwater observes that he "was propped up against a log," that his "hands were loosely tied with a lavender handkerchief," and that his "clothes were neatly piled by his side" (231-2). Tarwater's passively narrated violation works to convey that his perceived sense of masculinity cannot consolidate his autonomy, a point O'Connor makes by exploiting reductive midcentury assumptions about homosexuality.[117] Active or passive, masculine or feminine, the dandy's actions are reprehensible only because they isolate the desires of an individual at the utter expense of another. Tarwater's inability to count—"one, one, one"—reinforces this point, in drawing attention to his earlier discovery of words that count. The baptism counts because the words discovered through that action, though unintentional, take part in a larger plan—the plot of *The Violent Bear It Away* itself.

Midcentury (Math)culinity

The opening paragraph of *Strangers on a Train* features a similar confusion between gender and autonomy as that demonstrated by Tarwater. Clad in a gray-flannel suit, instead of a lavender shirt, and with a cigarette "fitted" into "the corner of his mouth," rather than hanging limply, Highsmith's Guy Haines embodies the same conventions of midcentury masculinity that

[117] O'Connor resented the implication that her fictional "freaks" were required to appease an "average" demographic of readers, as if borne out by "the social sciences." There is something ironic, therefore, about her use of gay stereotypes and caricature to create her depiction of the rapist. When it comes to sexuality, apparently, O'Connor can only convey what she perceives as grotesque through the stock and trade identifiers of a statistical type, an average assimilation of what she imagines a gay man is like. Consistent with the larger argument of this chapter, O'Connor needs "the social sciences" to produce her quintessential southern "freaks." Flannery O'Connor, *Mystery and Manners* ed. Sally Fitzgerald and Robert Fitzgerald (New York: Farrar, Straus and Giroux, 1970), 37-38.

O'Connor's dandy opposes. Guy is a rising member of the professional managerial class, with a promising job at an architectural firm, but he also "suggest[s] a style of the last century," a "look of intense purpose," and an image of "forward motion" (9). Guy is a self-made autonomous individual, whose decisions derive from, even as they reinforce, his sense of masculine authority. And yet, sitting on the train where the novel's drama begins, Guy's indecision begins "to paralyze his thinking . . . to make little blind alleys of the roads of logic." His gendered identity depends on rational agency, but in this moment, Guy doesn't know what to do. His indecision, moreover, stems from a lack of action: "he had been waiting, fretting, for something—*this*—to happen so he would be free" (10). In this moment, Guy resembles O'Connor's Tarwater. When asked three times, "Suppose nothing don't happen?" Tarwater insists, "Then I'll make it happen . . . I can act" (80). For both characters, a lack of action threatens their status as male protagonists, prompting them to make something "happen" instead.

When Guy encounters a switch point in *Strangers on a Train*, he becomes preoccupied with retaining his masculinity. But as with Tarwater, the mechanical force behind binary logic undoes Guy's masculine agency and replaces it with an automatic mode of action, a transition that occurs in a "moment": "There was a moment on the train . . . at which he thought something *must* happen . . . and immediately he felt easier, because he knew he was going to kill" (148). But this "moment" is only part of a sequence of others. Guy's decision to kill is the culmination of many discrete moments or instances that together erode his autonomous individuality: the "moment" that begins the novel (9); the "moment" that "seemed like a test, as if it were now or never again" (162); the "instant when he felt that life had left her" (106); "moments" that "separate from time before and time after" (225); and those "moments when he felt his whole being in some as yet unscrutable stage of metamorphosis" (116). Each event is a switch, a branch

in the possibilities of probable action with a before and an after: "He *knew* now. This was an instant [. . .] he felt his entire life would be different, must be different, from now on" (102). Guy's "metamorphosis" is his becoming a fictional automaton. Though he conceives of himself as an individual constituted by self-made actions, he begins to make decisions "mechanically" (95, 265, 267), or, to cite Highsmith's alternative adverb for this mode of action, "automatically" (9, 186, 258, 270). Guy comes to believe that because of his act of murder, "the best of himself" has been usurped by a "mechanical, absolute logic," a logic that, as I have clarified, designates a mode of switchbox thinking (178).

Like Tarwater, Guy experiences his loss of agency, which is also his detachment from a strictly masculine sense of authority, as part of his encounter with the divine. This encounter begins with his act of murder, which he perceives as a spiritual crisis: "where had his belief been when he murdered?" (179). Highsmith conveys the transition from autonomous to automaton, that switch-based "metamorphosis," as a spiritual conversion. Before, Guy understood his actions through the rationale of individual causality, in which all effects are attributed to an autonomous decision, because "all men had souls and the soul was entirely good," and, consequentially, "evil . . . always came from externals" (180). Under this initial theological premise, it was his weakness, the failure of his masculine authority that allowed an outside force to penetrate his will. As a result, Guy's social interests—his marriage, occupation, reputation—quickly deteriorate. After the murder, however, Guy announces a new spiritual belief: that "love and hate . . . good and evil, lived side by side in the human heart, and not merely in differing proportions in one man and the next, but all good and all evil." Guy turns from a logic that sees each switch as the cause of another, to a belief that they instead represent the coincidence of opposites, a confirmation that "all things had opposites close by":

> [E]very decision a reason against it, every animal an animal that destroys it, the male the female, the positive the negative. The splitting of the atom was the only true destruction, the breaking of the universal law of oneness. Nothing could be without its opposite that was bound up with it . . . Matter and energy, the inert and the active, once considered opposites, were now known to be one (180).

From "matter" and "energy" to "the splitting of the atom," Guy's new theology borrows heavily from the language of relativity and quantum mechanics. At the same time, Guy's scientific observations transcend physical reality to include the metaphysical properties of a spiritual order, an explanation of "good," "evil," and the "soul" based on a theory of opposites—a theory that Guy believes forms the foundation of "every decision." The physical and the metaphysical mingle, revealing a "universal law of oneness" that also breaches traditional boundaries of religion and science. "Perhaps," Guy now imagines, "God and the Devil danced hand in hand around every single electron!" (181).

The spiritual conversion Guy describes points to a newfound receptivity to the "universal law of oneness" that turns everything into its opposite, including his conception of gender: "the male the female." This moment accords with how the figure of Bruno is normally read, as a queer doubling of Guy's masculine normativity.[118] But we can see now that this function of Bruno's character works on Guy as O'Connor's dandy did to Tarwater, which is to say, Bruno facilitates Highsmith's resolution to the problem of convincing readers that a man in a gray-flannel suit will commit murder. In obliterating Guy's conception of masculine autonomy, Bruno entices him to submit to an unlikely mode of action explicitly described as the opposite of masculinity. Bruno works indirectly, never forcing Guy's hand, but manipulating him until he turn's Guy's resistance into an inevitable acceptance of larger forces. By the final page of *Strangers on a Train*, Guy realizes that his masculine concern for action no longer exists, and he

[118] For example, see Joshua Lukin, "Patricia Highsmith's *Strangers on a Train* as a Tragedy of Manners," *Paradoxa* 18 (2003): 157-194; Nathan Tipton, "Others from a Southern Mother: Southerning the Queer in Patricia Highsmith's *Strangers on a Train*," *South: A Scholarly Journal* 48.1 (2015): 129-150.

"surrender[s] without a word," not to Bruno, but to fate (280). The wordlessness of Guy's surrender presents a moment of thorough passivity, and when he chooses to utter his final words—"take me"—he relinquishes control completely, to the point where even the words feel spoken by another. They come out as "something entirely different from what he had intended" (281).

Highsmith thus closes her novel, as O'Connor did, with her protagonist losing control of his language. The moment refers back to the time of Bruno's proposal to swap murders. "You read too many detective stories," Guy had replied at the time, and "having heard himself, did not know where the words had come from" (30). The answer, that Guy's words originate with Highsmith as author, is implied in the words themselves. That is, Guy's language, like Bruno's idea to exchange murders, is the stuff of Highsmith's "detective stories." What Guy originally perceives as his lack of authoritative control, an inability to secure his masculinity through autonomous decisions, gives way to his gradual acceptance of an authorial will that exceeds his own, precisely by allowing him to retain his freedom to act. He learns to ask, "Who could be more genuinely humble than one who felt compelled to obey the laws of his own fate?" (211). In accordance with religious rituals, Highsmith follows the conversion that Guy experiences after the murder with his baptism—an elective action of faith. When Bruno drowns, Guy attempts to rescue him. He is submerged under water three consecutive times: father, son, and spirit. The first time he "sheds" his clothes, a symbolic casting off of the old self; the second time he searches, Christ-like, "with his arms wide"; and during the third submersion, "there seemed nothing but a silent gray vacuum filling all space, in which he was only a tiny point of consciousness" (263). Finally, "raising himself up," Guy is born again, at peace with the higher mathematics that have intervened.

Do Fictional Characters Act?

In the same year that O'Connor published *The Violent Bear It Away*, a novel that thematizes the mechanical nature of fictional autonomy, M.I.T. researchers wrote an algorithm to model fictional action. In an hour-long CBS program called "Tomorrow: The Thinking Machine," researchers showcased the production of a "TV Western" "written by" M.I.T.'s TX-0 computer running a program called SAGA. According to Doug Ross and Harrison Morse, SAGA's programmers, the TX-0 demonstrated that "creative work," like writing stories, depended on characters that exhibit "rule-obeying behavior."[119] A flowchart behind Ross illustrated the rules governing the algorithm that the TX-0 used to produce a narrative sequence (Figure 2). For every event, a branch indicated a binary choice between alternatives, what the programmers called a "switch." According to an internal memorandum, "a 'switch' is a probability branching device which controls the sequencing of action in SAGA."[120] The TX-0 calculated probabilities against variables that adjusted according to previous events, creating the illusion of realistic plotting. For example, the more whiskey the bandit drank, the less likely he was to shoot the sheriff. Not only had M.I.T. researchers reduced realism to a mere sequence of events, presenting character decisions as a matter of mathematical probability, they used fictional probability to claim that computers simulate aspects of human "thinking" (Figure 3). "You know," the CBS host said in response to the teleplay, "that's as close to magic as I've ever really seen." What the host took for "magic" was nothing less than the construction of what had long

[119] As Ross explains, "Just as a human playwright must obey certain rules in order to have a meaningful and understandable play . . . we must make the computer aware of the same kinds of rules." See *Tomorrow: The Thinking Machine* (CBS News: 1960), Computer History Museum, catalog no. 102651576. DVD.

[120] See "Memorandum 8436-M-29," box M4, folder 102648892, MIT Collection of Computing Projects, Computer History Museum.

been constitutive of novels—a display of characters making believable decisions, a "predictive" element that Roland Barthes says "gives narration the appearance of a huge traffic-control center"—though now enabled by algorithmic processes operating under probability formulas, a display of switch-box thinking.[121]

$$P_{n,k} = a_{n,k,0} + \sum_{j=1}^{16} (a_{n,k,j}) \cdot (b_j)$$

Figure 3: The probability formula that governs SAGA's narrative development. Source: the Computer History Museum

SAGA exemplifies how the advent of digital technologies draws attention to that which was already algorithmic to the art of fiction. That stories should derive from "rule-obeying behavior" suggests the digital colonization of narrative, the ostensible discovery of zeroes and ones at the heart of verisimilar plotting, a formal construction this chapter has described as switchbox thinking. Yet the example of SAGA also indicates the difference higher mathematics makes for authors working within the logic of switching. While the TX-0 could run commands in which the probability of character choice was mathematically inscribed, the machine could not make decisions beyond these commands. To account for the element of authorial choice, that is, to simulate the fact that the same probabilities could produce endless variations of narrative events, the programmers weighted their formulas with a random number generator, an element of chance meant to designate the caprices of human creativity. But as Mark Sample has shown, the

[121] Roland Barthes, "The Reality Effect" in *The Rustle of Language*, trans. Richard Howard (New York: Hill and Wang, 1986), 142. Higher mathematics may require us to update Barthes's metaphor, along with Paul Ricouer's sense that "emplotment" designates narrative as the "kingdom of the *as if*." Algorithmic processes of establishing probabilities instead operate on the relations of *if/then* statements. Such statements are present in Guy's continual processing in the conditional perfect tense: thoughts of what "might have been," of what he "might have asked," that Anne "might have come" (13).

generation of truly random numbers lies beyond the pale of computer programming; instead, the numbers derived from large, Borgesian books filled with such figures and made expressly for this purpose. A number was drawn from the book by a human programmer who then input it into the computer manually.[122] Like the accidents that constitute "jams" discussed in chapter one, randomness again presents the fallibility of human activity as a limit point of computation. The SAGA characters may have displayed a switchbox mode of thinking that appeared analogous to characters in postwar novels; but without the ability to orchestrate the coincidence of such decisions within larger narrative arrangements, SAGA's stories appeared less like a version of the same improbable realism crafted by Highsmith and O'Connor and more like mere randomly generated numbers. All switchbox thinking and no higher mathematics, the SAGA stories were devoid of "magic" after all.

In leaving their characters defeated and speechless before a spiritual power construed as an authorial presence, Highsmith and O'Connor take advantage of the quasi-mystical idea, quite popular among creative writers of the program era, that as novels are written, characters seem to act on their own.[123] They take advantage, that is, of precisely what Vladimir Nabokov once disparaged as "that trite little whimsy about characters getting out of hand," a cliché, he claimed, "as old as the quills." "My characters," he asserted with masculine bravado, "are galley

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[122] Mark Sample, "An Account of Randomness in Literary Computing." *Sample Reality* (blog), January 8, 2013. Accessed November 2020.

[123] In a letter to Betty Hester, O'Connor discussed her novel's preoccupation with decision-making: "I feel that in his place I would have done everything he did. Tarwater is made up out of my saying: what would I do here?" Highsmith, repeating a popular idea amongst contemporary writers, says she "lets [her] characters move and make decisions like living people, gives them a chance to debate with themselves, make choices, take them back, make others, as people do in real life." See "Correspondence, July-December 1959," box 2, folder 1, Letters to Betty Hester, Stuart A. Rose Manuscript, Archives, and Rare Book Library, Emory University; and Highsmith, *Plotting and Writing Suspense Fiction* (New York: St. Martin's Press, 1983), 45.

slaves."[124] Nabokov's focus on the constriction of his characters meant to secure his own modernist authority by demystifying the question—can fictional characters act? *Pnin*, after all, revels in its narrative probabilities to foreground the intrusions of its author. Highsmith and O'Connor, however, mark their ability to create narrative magic out of fictional probabilities by maintaining the mystery of characterological freedom, which in these novels looks like spiritual conversions. Guy and Tarwater aren't galley slaves, nor are they autonomous individuals. They are, in the language of both cybernetics and an unpublished story by O'Connor, automatons.[125] Their range of freedom ensures that they have been calibrated to submit to their creators, allowing Highsmith and O'Connor to secure their authority as authors as well.

[124] Gold, Herbert, "Vladimir Nabokov, The Art of Fiction No. 40," *The Paris Review* 41 (1967).

[125] O'Connor had been considering this aspect of fiction writing since she was a student in Iowa. An unpublished story written for an assignment, "The Automaton," explores the ontology of a fictional being as "a plastic character in a synthetic story," whose "machinery merely ran down" so that "his author could have wound him up again." The assignment received an A/A-. See "The Automaton," box 9, folder 14, Flannery O'Connor Collection, Series 2: "Writings," Stuart A. Rose Manuscript, Archives, and Rare Book Library, Emory University.

CHAPTER 3: PLOTTING INVISIBILITY: RALPH ELLISON'S NUMERICAL AESTHETICS FROM THE "AIRMAN NOVEL" TO *INVISIBLE MAN*

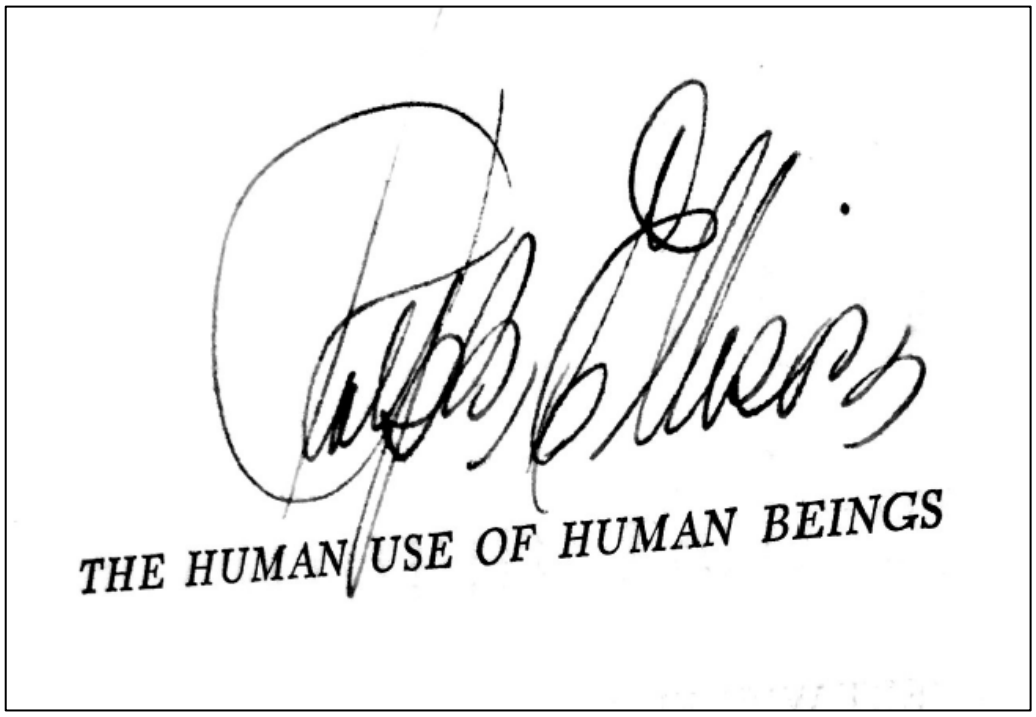

Figure 4: From Ralph Ellison's copy of Norbert Wiener's The Human Use of Human Beings*. Source: Ralph Ellison Personal Library and Ephemera, 1937-2010, Library of Congress*

Accounting for Statistics

Accidents abound in Ralph Ellison's fictional worlds. From the staged car accident in his earliest story "The Birthmark" (1940) to the factory explosion in *Invisible Man* (1952), chance also emerges with a plane crash in "Flying Home" (1944), an electrocution in "King of the Bingo Game" (1944), and the convergence of both (a lynching coincides with a plane accident, which causes an electrocution) in "A Party down at the Square" (n.d.). As with Nabokov, O'Connor, and Highsmith, Ellison made fiction expressive of its own probabilities; he played with the

aesthetics of accidents. *Invisible Man* serves as the apotheosis of these techniques, especially in its modernization of the picaresque novel, a genre that traditionally features a chain of events organized not by cause and effect but "by chance, or fortune, or providence, or accident."[126] Steven Belletto explains that with *Invisible Man* Ellison presented "various instantiations of chance to express senses of self independent of both American democracy and Communism as practiced."[127] Ellison's chance events thus appear to register, as Morris Dickstein contends, "man's urge and capacity to conceptualize his humanity beyond statistics."[128] Indeed, in the introduction that he wrote for *Invisible Man* in 1981, Ellison claimed to have left behind a literary form upheld by "the bland assertions of sociologists," confirming Dickstein's observation of "humanity beyond statistics."[129] Instead, Ellison avowed to have addressed "the literary problem of conveying the complex human emotions and philosophical decisions faced by a unique individual," affirming his commitment to the "individual," construed politically in Belletto's sense of a "self," "independent" of social governance. However, his appeal to a literary portrayal of "complex human emotions and philosophical decisions" also positions that individual formally—the free individual as the novel's proper aesthetic subject.[130]

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[126] See Petru Golban, *A History of the Bildungsroman: From Ancient Beginnings to Romanticism* (Cambridge: Cambridge Scholars Publishing, 2018), 105. On the picaresque elements in *Invisible Man*, see J. T. Hansen, "A Holistic Approach to *Invisible Man*" *MELUS* 6.1 (Spring 1979), pp. 41-54.

[127] Stephen Belletto, *No Accident, Comrade* (Oxford: Oxford UP, 2011), 83.

[128] Morris Dickstein, "Ralph Ellison, Race, and American Culture" in *Ralph Ellison's Invisible Man: A Casebook*, ed. J. Callahan (Oxford: Oxford UP, 2004), 134.

[129] Ralph Ellison, *Invisible Man* (New York: Vintage, 1952), xiv-xv. All subsequent references in parentheses.

[130] Ellison's chance events validate what Ian Watt called "the novel's serious concern with . . . the autonomy of the individual" (*The Rise of the Novel*, 60). Similarly, Georg Lukács disparages modernism and naturalism for their inherent limiting of narrative development to a subjective and therefore empty experience. Though naturalism and realism might resemble each other formally, for Lukács, naturalism shares in modernism's ideological "angst," which he defines as "the closing of one's eyes to the future"

Penning his introduction in 1981, it's little wonder that Ellison felt need to distance himself from a U.S. sociological tradition that used statistics to institutionalize anti-black protocols, from the emergence of nineteenth-century eugenics to Daniel Patrick Moynihan's infamous 1965 report, *The Negro Family: The Case for National Action*, which construed black and African American communities as a "dangerous social problem."[131] As Ellison explained, he was concerned about literary versions, like those popularized by his mentor Richard Wright, of "that pseudoscientific sociological concept," that "most Afro-American difficulties sprang from our high visibility" (*IM*, xv). In other words, Ellison sought to avoid a literary form that inadvertently reified actual social problems—"Afro-American difficulties" such as poverty, and unemployment—as natural or inherent symptoms of blackness ("our high visibility"), a process that sociological abstractions of race participated in. Ellison's disavowal of sociological realism, then, stems from its participation in the naturalization of race as an objective fact. In placing the onus of social problems on black bodies, sociological realism, according to Ellison, inverts what Dickstein saw in Ellison's fiction as "humanity" over "statistics." Moreover, by opposing sociology to the depiction of "complex human emotions and philosophical decisions faced by a unique individual," Ellison also confirmed what has become a conventional narrative of, in Barbara Foley's words, his career-long "movement from proletarian realism to a more experimental method."[132]

(*Realism in Our Time*, 73). This identification of angst allows him to distinguish the potential for action of free individuals found in realism.

[131] See Moynihan, Daniel Patrick. *The Negro Family: The Case for National Action* (Office of Policy Planning and Research, 1965). On the centrality of racist applications of statistics in U.S. sociological contexts see Tukufu Zuberi, *Thicker than Blood: How Racial Statistics Lie* (Minneapolis: University of Minnesota Press, 2008).

[132] The narrative of Ellison's movement from realism to modernism informs Foley's original approach of reading *Invisible Man* in light of Ellison's earlier work, a model that this chapter is indebted to, as I in

Several scholars have addressed Ellison's critique of sociology.[133] Less attention has been given, however, to Ellison's equally formative critique of individualism, which sheds light on the ostensible tension between race, statistics, and literary form. In an unpublished, rarely read speech titled "Minority Provincialism as a Problem in Creative Writing," delivered at Fisk University in 1953, Ellison offered a scathing analysis of New Negro literature, prompting what I will explain as the aesthetic crisis named by the title of the speech, in which fiction by black writers had come to assert individuality at the expense of an association with a "minority."[134] In opening his 1925 manifesto by championing the individualism of the New Negro over "the watch and guard of statistics," Alain Locke missed what Ellison's invisible man makes clear,

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turn consider the importance of an unpublished novel—the "Airman Novel"—to *Invisible Man*. At the same time, Foley's acceptance of Ellison's own narrative of literary progress leads to similar prioritizations endemic to the broader field of postwar studies that I describe in the introduction to this dissertation. Concluding that "early fictional works reveal that a number of symbolic motifs and dramatic structures prominent in *Invisible Man* . . . guided Ellison's imagination in his Marxist days" (12), Foley finds need to elevate Ellison's more realist writing by identifying their neglected "experimental" qualities. At the same time, by showing how Ellison's earlier leftist commitments cohere in his subsequent triumph, she values literary realism, like many postwar scholars, only as a vehicle for socio-political themes and ideas, rather than as a source of formal techniques that this chapter attempts to recover. See Barbara Foley, *Wrestling with the Left: The Making of Ralph Ellison's* Invisible Man (Durham: Duke University Press, 2010). Ellison's relationship to realism is often understood as a rejection of his literary training under Wright: Tamlyn Avery argues that *Invisible Man* indicates Ellison's "subversion of bourgeois realism"; A. Timothy Spaulding writes that Ellison "abandons a mode of narrative realism in favor of an erratic narrative voice"; and Thomas Schaub, who takes perhaps the most thorough look at Ellison's relationship to realism, determines that "Ellison's novel proposes a psychological narrative form—at places surreal and expressionistic—as being more realistic than the naturalism it supplants." See Tamlyn E. Avery, "Alienated, Anxious, American: The Crisis of Coming of Age in Ralph Ellison's *Invisible Man* and the Late Harlem Bildungsroman," *Limina* 20.2 (2014): 1-17; A. Timothy Spaulding, "Embracing Chaos in Narrative Form: The Bebop Aesthetic and Ralph Ellison's *Invisible Man*," *Callaloo 27.2 (*2004): 481-501; and Thomas Schaub, "Ellison's Masks and the Novel of Reality" in *New Essays on Invisible Man.* Ed. R. O'Meally (Cambridge: Cambridge UP, 1988): 123-153.

[133] On Ellison and sociology, two works that have been essential for my understanding include Stephen Schrier, *Fantasies of the New Class: Ideologies of Professionalism in Post-World War II American Fiction* (New York: Columbia UP, 2011) and Scott Selisker, "Simply by Reacting: The Sociology of Race and *Invisible Man*'s Automata," *American Literature* 83.3 (2011): 571-596.

[134] Ralph Ellison, "Minority Provincialism as a Problem in Creative Writing," box 1:101, folder 8, Ralph Ellison Papers, Manuscript Division, Library of Congress. Further references cite page numbers as printed on the archived materials.

when speaking in front of a group of poor, displaced, Harlem residents: "You heard the sister's statistics on our infant mortality rate. Don't you know you're lucky to be uncommonly born?" (*IM*, 343).[135] Clearly, Ellison understood how statistics about race can be manipulated towards models of both social and aesthetic determinism; but overemphasizing Ellison's belated critique of sociology, and by extension realism, risks missing how his fiction emerged from what this chapter identifies as an opposed sense of how a quantitative conceptualization of race necessarily models the processes of formalizing more complex psychological expressions of living on the numerical fringe, of being "uncommonly born." Ellison's chance events, I argue, don't move "beyond statistics," in Dickstein's phrasing, but draw attention to quantified life, that is, a conception of a minority population that lends an individual's narrative progress meaning.

This chapter takes its cue from Ellison's identification of the impetus for *Invisible Man* as emerging from the throes of a previous literary endeavor. "I was in the process of plotting a novel based on the war then in progress," he writes, when "I was confronted by nothing more substantial than a taunting, disembodied voice" (*IM*, xiv). In what follows, I consider the process by which, according to Ellison, a set of formal decisions, enacted at the most fundamental level of "plotting a novel," led to the metaphor of invisibility, perhaps the chief metaphor of black subjectivity in twentieth-century American literature. This transition suggests an account of something more complicated than Ellison's "movement" from realism to modernism and from absolute acceptance to repudiation of social scientific principles. In particular, this chapter identifies the preponderance of improbable events that constitute *Invisible Man*'s plot as evidence of a radical synthesis of the more realist project that he abandoned and the one that began with his discovery of a "disembodied voice." Though only a mere collection of notes, a formal proposal for a Julius Rosenwald Fund, and a smattering of written prose, the "Airman

[135] Alain Locke, *The New Negro* (New York: Simon and Schuster, 1992 [1925]), 3.

Novel"—the name under which these materials are archived at the Library of Congress—provided Ellison with the basis for his metaphor of invisibility. I clarify how the "Airman Novel" grounds invisibility in what the proposal for his earlier novel described as an "awareness of numerical weakness," a subjective orientation based on a mode of quantification. By developing a protagonist who learns to fall in step with chance, Ellison plotted invisibility through *Invisible Man*, externalizing the lived reality of his earlier protagonist's merely psychological "awareness of numerical weakness."

In tracing numerical ideas in Ellison's unpublished writings to his subsequent literary triumph, this chapter contributes to recent critical work to revise the quantification of black life—a history rooted in the mathematics of colonialism and slavery—by asking, along with Katherine McKittrick, "Can we really count it out differently?"[136] Scholars such as McKittrick, Sarah Wilson, and Alexander Weheliye de-colonize quantification by showing how it has also been instrumental to antiracist discourse.[137] By demonstrating Ellison to have anticipated antiracist interests in statistical chance, this chapter clarifies how his movement in metaphor, from "numerical weakness" to invisibility, adds an aesthetic dimension to such efforts. Moving from cryptographic reading and higher mathematics, those strategies of improbable realism laid out in chapters one and two, this chapter determines how the aesthetic distribution of unlikely

[136] McKittrick's question addresses the possibility of countering the determinism of racist projects based on quantitative practices with a "nondeterministic schema," that is, a conceptual apparatus that takes advantage of mathematical incorporations of "uncertainty." Katherine McKittrick, "Mathematics Black Life," *The Black Scholar: Journal of Black Studies and Research* 44.2 (2014): 23.

[137] Much of this work has focused on the writings of W. E. B. DuBois, who countered the sociological idea that blackness predisposed and thus predetermined black individuals to fixed social conditions and degenerative heredity by instead using scientific tools of quantification and visualization to reveal how material contingencies construct the socio-economic conditions of race, or as Alexander Weheliye puts it, how "the rhythm of chance represents the political physiognomy of the Negro" (36). See Sarah Wilson, "Black Folk by the Numbers: Quantification in Du Bois," *American Literary History* 28.1 (2015): 27-45; and Alexander Weheliye, "Diagrammatics of Physiognomy: W. E. B. Du Bois's Graphic Modernities," *The New Centennial Review* 15.2 (Fall 2015): 23-58.

events specifically guides the formal representation of racial identity in Ellison's writings. By plotting invisibility, that is, by forging a *bildungsroman* expressive of black life, Ellison's novel develops a nondeterministic novel form in which an ostensibly free individual remains linked to a statistical population, prefiguring a conceptualization of chance contemporaneous with what Norbert Wiener described in his treatises on cybernetics as the "new statistics." In the conclusion to this chapter, I look to the annotations and marginalia of Ellison's personal copy of Wiener's *The Human Use of Human Beings* (Figure 1) to offer an unprecedented reading of Ellison reading Wiener.

Numerical Weakness

In a scribbled note, summarizing his ambition for a project begun in 1942 but abandoned soon after the war, Ellison announced his goal of depicting nothing less than "democracy achieved under [the] most inhuman conditions of [a] concentration camp."[138] From its inception, the intended subject of the "Airman Novel" presented a tension, if not an outright contradiction, of political representation. On the one hand, Ellison drew inspiration from actual news clippings and even personal correspondence with both Jewish and black camp survivors.[139] Despite such grounding in reality, Ellison's lofty goal of portraying the "inhuman conditions of [a] concentration camp" aspired towards a representation of recent historical atrocities that few

[138] Unless otherwise noted, information about Ellison's unwritten novel comes from a single archival folder at the Library of Congress labeled "Airman Novel," which contains two drafts of a project description, several pages of notes, and an initial draft of one chapter. See Ralph Ellison, "Airman Novel," box 1:115, folder 1, Ralph Ellison Papers, Manuscript Division, Library of Congress.

[139] Barbara Foley provides a detailed summary of Ellison's research on P.O.W. survivors in what is perhaps one of the only critical accounts of the "Airman Novel" in Ellison scholarship. See Foley, *Wrestling with the Left*, 147.

postwar writers dared represent and what some considered unrepresentable.[140] The tension between sociological realism and a more abstracted form was already apparent in Ellison's proposal: "The setting is a Nazi prison camp. However, the novel is highly imaginative and thus does not depend upon the naturalistic depiction of such a camp. The camp itself is important only in supplying situations wherein it is possible for me to secure those clashes of personality and ideas central to my theme." Apparently, the camps provided Ellison with an impetus for negotiating between "naturalistic depiction" and the more sophisticated portrayal of "clashes of personality and ideas," the same negotiation that he would later identify as formative of *Invisible Man*.

The story Ellison wanted to tell began with a descent. "After bailing out of a disabled plane," Ellison's protagonist "is captured and placed in charge of an internment camp of American airmen, most of whom are white." Encountering an opportunity unavailable to him at home, that is, being "given the power of life and death over his group of fellow nationals, several of whom are white," the airman overcomes the temptations to abuse his authority—prompted by both his past experiences of racist "humiliation" as well as the manipulations of a Nazi "psychologist"—and thus achieves a glimpse of actual social equality. Like the novel's setting, its premise also contained an unavoidable contradiction. The central drama would unfold around

[140] For Hannah Arendt, the camps presented an unprecedented form of bureaucratic "administration" that marked the failure of "social science techniques" to adequately account for the "unreality" experienced in these camps (61). Representatives from the humanities, meanwhile, such as Mary McCarthy and Stanley Edgar Hyman, similarly declared the camps as a problem for the novel. As with Arendt and her claim of "unreality," McCarthy listed the camps as one sign of the "irreality" of postwar American society that presented a representational problem for the future success of the novel; and Hyman, with equal measure, complained that novels cannot encompass "the murder of millions," which only seemed "meaningless to the imagination" (20). Postwar intellectuals thus conceived of the wartime camp as a problem of representation, affecting both social scientists and fiction writers, or those who dealt in numbers and those who worked with words. Hannah Arendt, "Social Science Techniques and the Study of Concentration Camps," *Jewish Social Studies* 12.1 (1950): 49-64; Mary McCarthy, "The Fact in Fiction" *Partisan Review* 27.3 (Summer 1960): 438-458; Stanley Edgar Hyman, "Bernard Malamud's Moral Fables," *The New Leader* 46.22 (1963): 20-22.

the airman's "administration of the camp," a somewhat problematic conceit, since it rooted the source of democracy—the airman's discovery of social equality—in the technocratic governance and bureaucratic efficiency of Nazi "administration." Ellison's abandonment of the project is perhaps unsurprising, as it coincided with those years in which Nazi "administration" provided Hannah Arendt with the watchword for describing the banality of evil, and in which Americans were haunted with the thought of dying, according to Norman Mailer, "as a cipher in some vast statistical operation in which our teeth would be counted, and our hair would be saved, but our death itself would be unknown, unhonored, and unremarked."[141] In handwritten notes, Ellison was clear about the camp's symbolic purpose: the camp served as a "microcosm of culture, Negro + white," or again, "internment camp (a metaphysical concept: the democratic state both large and small)." Ellison's notes clarify that he hoped to craft a novel in which the camp would function as a crucible from which the goodness of American democracy might emerge, but it seemed apparent even as Ellison was still in the planning stage that the camp unavoidably surfaced a cold, inhuman, even statistical conception of humanity. As one scribbled note stated ambiguously: "Negro compelled to analysis out of awareness of numerical weakness." What hope did the "Airman Novel" have with postwar readers if the protagonist's vision of democracy derived from the same techniques of "numerical" "analysis" as Mailer's "statistical operation," in which only "teeth would be counted"?

Looking back at the "Airman Novel" while penning the introduction to *Invisible Man*, Ellison narrativized his abandonment of the project to embellish the sense of triumph that arrived with the "disembodied voice" of his invisible man. Inviting us to imagine a spark of inspiration that moved Ellison from the failure of one project to the success of another, he wrote, "For while

[141] Norman Mailer, "The White Negro: Superficial Reflections on the Hipster" in *Advertisements for Myself* (Cambridge: Harvard University Press, 1992), 338.

I had conceived of it in terms of a black-white, majority-minority conflict, with white officers refusing to recognize the humanity of a Negro . . . I came to realize that my pilot was also experiencing difficulty in seeing *himself*" (xiii). The metaphor of invisibility, Ellison would have us believe, emerged from a more complicated psychological orientation of what had been the merely abstract binary of "a black-white, majority-minority conflict." Ostensibly overcoming this rudimentary sociological conceptualization of race by aesthetically experimenting with a "disembodied voice," Ellison advances the metaphor of invisibility as a more compelling representation of black subjectivity, interpolated by acts of "seeing" that invoke aspects of both Freudian psychoanalysis and DuBoisian double consciousness. Yet just as Sarah Wilson has shown how double consciousness grew from quantitative ideas developed in DuBois's own sociological work, Ellison's earlier plan to craft a novel in which a black airman's "analysis" of himself is "compelled" by his "awareness of numerical weakness" challenges the given narrative of *Invisible Man*'s development.[142] If the plan was to use the conditions of the camp to dramatize the airman's ability to see himself as a black "minority," if only from the perspective of a white "majority," then it would seem that the quantitative fact of "numerical weakness" had more to do with the emergence of invisibility as an internal subject position than Ellison led readers to believe.

We can glean how "numerical weakness" in the "Airman Novel" translated into elements of *Invisible Man* from the sparse extant pages of actual prose. In one of the only written scenes, the airman has been brought to meet the Nazi camp leader, a "psychologist" who plans to exploit the racial tensions between the airman and his countrymen to stage a social experiment. The German officer plans to put the black soldier in charge of the other Americans to draw out the airman's "racial inferiority" and to provoke social tensions that the officer imagines will end in

[142] See Sarah Wilson, "Black Folk by the Numbers: Quantification in Du Bois."

disaster, even violence. The initial confrontation between the men begins in silence, an opportunity for each to size the other up. In this moment, Ellison contrasts the airman's humanity to the Nazi leader's sinister social scientific machinations. The airman's mode of "looking for the imprint of the man's deeds, his philosophy, upon his face," opposes the Nazi commander as he "studied his papers," less curious about the human prisoner in front of him than in information drawn from a single brown "folder." The airman's personal act of determining his opponent's "philosophy" by staring at his face is clearly meant to stand out against the bland assessment of facts and numbers contained within a bureaucratic "folder"—an unambiguous emblem of camp administration. And yet, in describing the airman's search for meaning in the "imprint" of something written on the man's face, Ellison construes his process of discovery as an act of reading, not unrelated to the Nazi psychologist's perusal of printed words on paper.

In this standoff between observers reading each other, Ellison further conflates their processes of analysis by suggesting similar outcomes. The result is that both men reduce their opponent to a racialized category. The commander brazenly lists racist epithets to demean his prisoner: "That's what they call you, isn't it?" The airman, in turn, stares at his captor's face, noting, "The face might have been American or English," and "indeed, he looked like the picture of an American diplomat he had seen in a newspaper." Even as the officer limits the airman to a racial category, the airman generalizes the Nazi's whiteness. Eviscerating national differences between warring countries, he reduces the officer's individuality to a product of mass media, a mere face in a "newspaper." The deeply personal act of determining a man's "philosophy," the "imprint of the man's deeds," by staring at his face, produces the same outcome as the bland assessment of facts contained within a bureaucratic "folder," reducing the airman to feelings of "numerical weakness." Both men, in effect, refuse the individuality of the other in a conflict that

renders one's enemy a statistical "type." In fact, the language of social "types" emerged in Ellison's own articulation of his fictional camp, as he conveyed in a note that it will be populated by "types of whites: worker, intellectual, scientist, fascist, southerner, etc." The language of sociology migrated from Ellison's own construction of his minor characters to the Nazi officer's conception of the camp as a scientific experiment in the actual story.

This scene documents an integral step in Ellison's transition towards a new novel that frames the former confrontation of racial types as a problem of visibility. Early in *Invisible Man*, the protagonist's key illustration of his invisibility begins when he "accidentally bumped into a man" whom he nearly kills (4). The scene, so key to the rest of the novel and to the novel's long-standing reception, turns out to share a great deal with the scene from the earlier novel in which Ellison sought to face off his nameless black protagonist against the German camp leader. Just as the camp leader, whose "face might have been American or English" is typified by "[his] coldest blue eyes" and "blond face," the invisible man also sees his adversary as merely "a tall blond man" with "blue eyes"; and while the airman attempted to discover "the imprint of the man's deeds, his philosophy, upon his face," invisible man "[seized] his coat lapels" so that "my face came close to his"; so it is also the case that the German leader's numerical disregard of the airman, which takes the form of a mere "folder" of facts, corresponds with the attacked man's typification of his attacker to a "mugger," while the white men, in both scenes, end up with their face in the newspaper. The motivation for telling about the near murder of a man on the street, after all, is the protagonist's delight in seeing the man's picture the following day in the *Daily News* with a caption "stating that he had been 'mugged'" (5).

Fundamentally, then, invisibility begins with a conception of statistical identity, a theory of types. That the white man did not see another person but a walking statistic, a black mugger,

causes the men to "accidentally" collide. This chance encounter, the first of but many others that constitute the novel's chain of events, emerges from the protagonist's life at the fringes of statistical awareness. By relocating the confrontation with an Aryan from a Nazi camp to a Harlem street, Ellison eliminates the problem of locating democracy within a concentration camp. More importantly though, the revision suggests that the act of "seeing himself," that is, of comprehending his loss of humanity as his invisibility to others, begins with what the earlier novel described as "awareness of numerical weakness," the first lesson of the protagonist's education in learning to walk in step with chance.

Double Lossness

In the unpublished speech "Minority Provincialism as a Problem in Creative Writing," Ellison made the daring assertion that "literature is the voice of a group" (6). Basking in the success of *Invisible Man*, Ellison commented on what he perceived as a crisis of postwar black fiction owing to the tradition set by "American Negroes who wrote during the 1920's/early 30's." Only alluding to the New Negro movement, Ellison clarified in private that his speech would "point out where the so-called New Negro boys crapped up the picture."[143] If New Negro writing deviated from the literary goal of conveying "the voice of a group," then it would seem that Ellison's speech characterized the movement in terms vastly opposed to those of African American literary critics who emphasize the movement's attempts to forge a collective sense of black identity.[144] Recovering Ellison's obscure speech on "Minority Provincialism" clarifies a

[143] Ralph Ellison and Albert Murray, *Trading Twelves*, ed. J. Callahan (New York: Vintage, 2001), 9.

[144] According to Patrice D. Rankine, the New Negroes "called for an unprecedented Negro independence," making them a forerunner to the Black Arts Movement of the 1960s to which Ellison would also find himself opposed. Lawrence Patrick Jackson identifies their resistance to "stereotypes"

distinction Ellison makes that puts the "group" of literary representation into sociological terms. When viewed as part of this context, moreover, we can detect in Ellison's critique of the New Negro movement an even subtler condemnation of his own "Airman Novel," a failure seen more keenly in light of *Invisible Man*'s success.

"Minority Provincialism" addressed what Ellison understood as "an attitude wherein Negro writers pleaded the humanity of Negroes," thus diminishing their art with a sense of "deadly provinciality" (5). "[H]ere was a writing," Ellison explained, "that was addressed not inwardly but outwardly," "not to Negroes but to whites." According to Ellison, in their push towards universality, New Negro writers achieved mere provinciality; in casting off the signs of their connections to a majority, they also lost their own strategic identification as a "minority." They were, in Ellison's words, "Negroes who wanted to be human without being Negroes" (7). Ellison saw this exclusion from their own minority group as a secondary loss, preceded and thus caused by a primary loss of the general Americanness they denied. "There is no general without the specific," Ellison explained, "and they sought to be general without the specific, for it was the specific of which they were ashamed." Ellison's warning, delivered to a room of black scholars, artists, and intellectuals, was that "we are the inheritors of a double lossness" (7).

As a solution, Ellison looked to what he gauged as the best of American fiction, claiming its ability to suggest "the whole through the part, the general through the specific." "Literature," he explained, "can only flourish within a group which basically accepts itself." Ellison likened

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with their disassociation from the entirety of "the allied Western world." And Barbara Foley describes the movement's push for independence as "metonymic nationalism," a kind of strategic essentialism intended to confront white nationalism. In light of such clear appeals to collective identity, Ellison's criticism of the New Negro movement for not catalyzing "the voice of a group," depended on precise expectations about group identification. See Patrice D. Rankine, *Ulysses in Black: Ralph Ellison, Classicism, and African American Literature* (University of Wisconsin Press, 2008), 78; Lawrence Patrick Jackson, *Ralph Ellison: Emergence of Genius* (University of Georgia Press, 2008), 278; and Foley, *Wrestling with the Left*, 2.

the literary endeavor of appealing toward universality by first expressing a perspective of specificity to a process of abstraction, not unlike in "the social sciences," where "there is no Man except in the abstract . . . there is only the Ger-Man, the English-Man, the African-Man . . ." (7). It is the relationship of the general to a "minority," however abstracted, that the New Negro movement, and thus, in Ellison's view, a great swath of African American literary production ignored. Alain Locke, after all, opened his 1925 manifesto by championing the individualism of the New Negro over "the watch and guard of statistics." In doing so, Locke missed what Ellison imagined was literature's unique provenance: "Ideally," Ellison wrote, "literature is both complex and simple because it recognizes that the basic outlines of a group's experience are simple; complex because in its sophisticated form it deals with the limitless variations of the human" (5). Much like Nabokov's traversal of the translatable and the untranslatable, or O'Connor's movement from human choice to divine will, Ellison positions literary "form" as profoundly suited to mediate between the "simple" and the "complex"—between the "abstract' expressions of "the social sciences" and the well-nigh "limitless variations of the human."

Ellison's invisible man exemplifies how Ellison advanced these strategies of quantifying the unquantifiable by drawing attention to the dimensions of racial identity. For example, he announces in the concluding moments of the novel that he has "tried to give pattern to the chaos which lives inside the pattern of your certainties" (581). In establishing possible negotiations of the general and the particular, the simple and the complex, "pattern" and "chaos," Ellison's speech clarified his elevation of chance as more than mere thematic content, but something that must be enacted at the level of form. "The novel," he claimed, "is the art of process." "Minority Provincialism" upends assertions that Ellison's aesthetic sensibility prioritized linguistic play and experimentation over realist plots, when Ellison instead envisioned an aesthetic "process" that

linked them, a formal element that gave "pattern to the chaos which lives inside the pattern of your certainties." In fact, provincialism, he explained, arises from the assumption "that the novel communicates through concepts, words." Denying pure modernist interiority, he insisted that the novel, "communicates through actions depicted in words. Thus when it is most dramatic it is most widely understood" (underline in original).

The mediation of "action" through "words," as well as his claim that his own cultural moment had "inherited" the defects of a previous literary moment, suggests that with "Minority Provincialism" Ellison targeted not only the New Negroes, but himself. In the wake of *Invisible Man*'s success, Ellison's concept of "double lossness" echoed his own description of the protagonist of the unwritten "Airman Novel" as "a doubly isolated man." "He has been unable to accept," Ellison wrote a decade earlier than "Minority Provincialism" in his plans for the novel, "either the 'Negro' way of life, or those values embraced by white Americans that lie beyond the color line." Ellison imagined that the novel would open with the airman parachuting from a plane in a moment that figures as a fall from grace, his self-expulsion from his own racial identity: "He has bailed out to lighten the load of his bomber, an act received by his mates as heroic, but with an unmistakable sense of relief. For the hero had not been too well adjusted to the rest of this all-Negro crew. He is an intellectual-technician, representative of a new Negro type; and his concern with absolutes, values, meanings, caused him to function as a bad conscience for the rest of the crew." Like Locke's New Negro, who Ellison believed abandoned his identification as part of an American whole, only to lose a more particular identity as a racial "minority" as well, the airman begins the novel as already ostracized from his black regiment, a consequence of his self-strivings as a "new Negro type."

As the airman is captured and interred in a Nazi prisoner-of-war camp, he moves from a space of black crewmembers to "an internment camp of American airmen, most of whom are white." The sacrifice made when he leapt from the damaged bomber, which was really an escape from the minority group he resented, is redoubled when the airman risks his life again in the novel's planned ending, this time for his white compatriots, who flee the Nazi camp while he holds back and is killed. The double sacrifice of the airman expresses the "double lossness" of the "new Negro type," each sacrificial death a metaphor for his exclusion from the part and the whole, the particular and the general. As another handwritten note clarifies: "For the democrat the prison camp is a forced regression and a form of death, thus he must be killed off" (underline in original). Whereas the "Airman Novel' was meant to show a black pilot earning his Americanness by sacrificing his life for the white majority, *Invisible Man* features a young man tracing his roots in black folk life as a means of discovering the Americanness that's already his. Ellison thus arrived at the key dynamics of black subjectivity he wanted to explore while planning a more realist project. The wartime drama constituted a series of actions—ejections from planes and escapes from camp—that exemplify the possibility of objectifying externally the internal patterns of invisibility, which his subsequent novel would carry out to tremendous accliam.

The failure of the "Airman novel" is that it never realized Ellison's goal of establishing the novel as "the art of process." In abandoning the earlier project, Ellison gave up on a protagonist whose subjective perspective could but remain an abstract "he" who looks at his enemies "from a distance far behind the surface of his eyes," a "cold, mechanical performance." *Invisible Man*, on the other hand, translates the more intimate perspective of its first-person

narrator—having eventually embraced his belonging to a "minority"—into a voice that speaks "on the lower frequencies" for a broader American collective.

Difference Machines

Looking closer at these unpublished and largely unread archival materials clarifies that Ellison's novels anticipated broader shifts within the field of statistics. Responding to what I have described as an impetus to quantify the unquantifiable, the "Airman Novel" situates Ellison's fiction as part of a growing diminishment of nineteenth-century statistical approaches, including the methods of eugenics, that moved deterministically from large generalities to abstracted specificities. The displacement of this idea, at least in the physical sciences, was described by Norbert Wiener, first in his landmark *Cybernetics* (1948) and then again for a more general audience in "The Idea of a Contingent Universe," the preface to *The Human Use of Human Beings* (1950). Describing nothing less than a twentieth-century scientific revolution, Wiener explained in the latter text that "chance has been admitted, not merely as a mathematical tool," as it had in the past, "but as part of [science's] warp and weft."[145] This meant that "modern scientists were not concerned with large numbers of similar particles, but with the various positions and velocities from which a system might start." By disregarding "large numbers of similar particles," Wiener casts aside the old regime of statistics in which, for example, sociologists continually drew upon the law of large numbers to show the predictable median curve of general phenomena such as intelligence, heredity, and employment. The "new statisticians," Wiener claimed, "rejected" that systems can be "described by fixed causal laws," those very laws by which chance seemed to be tamed, according to Ian Hacking. Instead, the

[145] See Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (London: Free Association Books, 1950), 11.

new statisticians were interested in establishing formal laws capable of describing the different possibilities of a system by modeling "the contingency of events."

Remarkably, we have failed to connect Wiener's pivotal account with Ellison's concurrent formal experiments with the contingency of literary events. More remarkable still because Ellison not only owned a copy of Wiener's *The Human Use of Human Beings*, but clearly saw an affinity between it and his own work. In Ellison's personal copy of Wiener's book, now housed at the Library of Congress, the use of blue, black, and green ink, as well as pencil, to make paratextual notations and marginal annotations, often on the same page, indicate that Ellison read the preface more than once, and possibly several times.[146] Filled with exclamation points in the margins, underlined phrases such as "probabilistic universe," "the contingency of events," and "the new statisticians," and even scribbled rewordings of the definitions of probability and entropy, Ellison's notes convey a clear sense that he recognized in Wiener's account of modern science a set of ideas that his own novel prefigured.

On the table of contents page, separate from all other marginalia and possibly indicative of a key point Ellison wanted to retain, he wrote in large script: "Entropy is equal to the increase of probability associated with any given phenomena." If this statement represented the crux of Ellison's readings of Wiener, then it was also the source of Ellison's critical engagement with the cybernetic project. I'd like to imagine that the definition comprised Ellison's first reaction, an initial attempt to learn from Wiener according to the cybernetician's own terms. But in a second reading, Ellison moved from accepting the definition at face value to a question, scribbled in the margin on the page on which Wiener offered his probabilistic definition: "How does contingency measure as a term for negativity?" The question referred to a sentence in which Wiener,

[146] See Ellison, Copy of *The Human Use of Human Beings*. Ralph Ellison Personal Library and Ephemera, 1937-2010. Room B, bookcase VII, shelf 5. Library of Congress, Washington D.C.

somewhat famously to media theorists, attaches entropy to a moralistic sense of "evil": "For this random element, this organic incompleteness, is one which without too violent a figure of speech, we may consider evil; the negative evil which St. Augustine characterizes as incompleteness."[147] Ellison may not have had the kind of grounding in thermodynamics or knowledge of Maxwell's demon that we associate with a novelist such as Thomas Pynchon, but Ellison recognized in Wiener's comments a reference to an idea of which his close friend and interlocutor Kenneth Burke was somewhat of an expert. As part of his career-long investigation of the devices that constitute human expression, Burke wrote frequently about what he described as the rhetorical figure of the negative, including a chapter on St. Augustine in *The Rhetoric of Religion* (1961). The negative does not occur in nature, Burke wrote, but "is a function peculiar to symbol-systems, quite as the square root of minus-one is an implication of a certain mathematical symbol-system."[148] Burke offered a formalist conceptualization of the negative, in which the negative, like a mathematical symbol, is not an essential reality to be found in nature but part of a formal system in which relations are defined by the differences between a system's constitutive parts. The idea resonates with Ellison's literary interest in the "limitless variations" of the individual who belongs to a group, as well as Wiener's new statistics, which concerns itself not with the actualities of a particular state of reality, but the "various positions and velocities from which a system might start," in a probabilistic sense. In fact, Burke also writes that while one is limited by the fact that something "is exactly what it is, you could go on for the rest of your life saying all the things that it is not."[149] In all these accounts, identity derives not

[147] Wiener, *The Human Use of Human Beings*, 11.

[148] Kenneth Burke, *Rhetoric of Religion: Studies in Logology* (Los Angeles: University of California Press, 1970), 20.

[149] Kenneth Burke, "Definition of Man," *Hudson Review* 16.4 (1963-4), 499.

from the representation of internal truths but from the articulation of external differences. Surely, the articulation of external difference describes an integral aspect of the metaphor of invisibility. Invisible man's violent encounter with the Aryan man, an "accident" that occurs on the sidewalk, is one articulation of difference that, along with the many others that constitute the narrative of *Invisible Man*, posits the potential for self-identification. Whoever the nameless protagonist is (and he may never truly know), he slowly learns, through one chance encounter after another, that he is not Mr. Norton; he is not Bledsoe; he is not Trueblood; etc—the digital logic at the heart of *bildungsroman*.

But Ellison is not done reading Wiener. Underneath his first question Ellison asked a second: "Does K.B. ever define the negative as 'evil'?" If the tone of skepticism isn't clear enough, a new ink color indicates a third reading, as Ellison returns to this passage yet again. Next to Wiener's explanation that entropy was "nature's tendency to degrade the organized and to destroy the meaningful," Ellison rejects the passage as "Rhetorical + irrational." Ellison's series of readings gradually shifts from a state of observation to one of interrogation before finally entering the realm of criticism. Ellison's paratextual critique of cybernetics puts pressure on Wiener's "rhetorical and irrational" need to add a moral dimension to the concept of entropy. Surely difference is valued in the formalist paradigms of Ellison, Wiener, and Burke, their own systemic differences notwithstanding. But why, Ellison's notes ask, must sameness be construed as evil? As Ellison's earlier writings make clear, the persistence of the individual falters without the association of a group. Difference coincides with a sameness to "give pattern to the chaos." Otherwise, in the double lossness that results, identity—particularly racial identity—slips into a negative even more unassailable than entropy, a nothingness that renders one socially invisible. In the coda, I explain how the work of Thomas Pynchon carries the theory of cybernetics to a

similar logical conclusion, arriving precisely at the eradication of the racialized self that, while long attributed to a postmodernist aesthetic, Ellison had already explored in his metaphorical development from "numerical weakness" to invisibility. In fact, later in *The Human Use of Human Beings* Wiener describes the discovery of a probabilistic world as the scientific erasure of an "old naïve realism." Ellison, pen in the margins, tongue in cheek, suggests that the phrasing indicates a new "Theory of Fictions." With the improbable realism that Ellison's own fiction helped codify in the cybernetic moment, his speculation was more precise than he knew.

CHAPTER 4: NARRATIVE ARCS: RACE AND THE POLITICS OF PROBABILITY IN EUGENE BURDICK'S *THE 480*

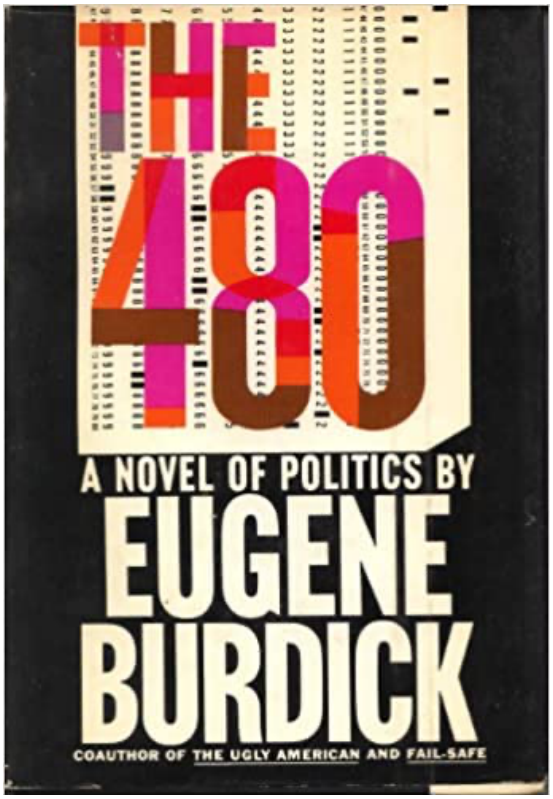

Figure 5: Cover image for The 480*, featuring a punch card.*

Books and Curves

Media determine our presidents; or so Friedrich Kittler might have written had he preferred Eugene Burdick to Thomas Pynchon. Burdick's *The 480* (1964) constituted a literary response to the presidential campaign of John F. Kennedy and its unprecedented use of

computers on the campaign trail.[150] In 1960, Kennedy hired the Simulmatics Corporation, led by Dr. Ithiel de Sola Pool, to aggregate political polls and demographic data to analyze how the campaign might adjust to the shifting attitudes of different voter groups. Taking his title from the precise number of demographic groups analyzed by the Simulmatics Corporation, Burdick penned *The 480* to warn Americans that a "new underworld" of political power had emerged, one made up of "slide rules and calculating machines and computers which can retain an almost infinite number of bits of information as well as sort, categorize, and reproduce this information at the press of a button."[151] Burdick went so far as to publish the complete list of voter demographics, all 480 groups devised by Simulmatics, in an appendix to the novel, so that readers might encounter the terms by which the government grouped them demographically (e.g., "Democrat, Eastern, Protestant, Male, Rural, Professional/White Collar"). In the same spirit that Vladimir Nabokov denounced automatic translation, Flannery O'Connor condemned statistical truth, or Ralph Ellison disavowed sociological abstraction, Burdick fashioned a tale of an American capitalist turned presidential hero to exemplify how the unpredictable tenacity and charisma of human individuality might still triumph over an age in which political machines reduced private citizens to statistical groups. But as with these others, Burdick's demurral of quantification wasn't the end of the story.

The hero of *The 480*, John Thatch, earns the favor of American voters precisely because

[150] Remarkably, Burdick's 1964 novel is not the only political thriller from that year written and published in response to Kennedy's 1960 digital campaign. *Convention* by Fletcher Knebel and Charles W. Bailey II also constructs a political plot about the 1964 Republican convention, the threat of digital computation to the political process, and the triumph of a single, heroic candidates who connects with the voice of the people rather than the mathematics of the machines. While much of the present argument also applies to *Convention*, this chapter focuses largely on Burdick's novel because of its self-reflexive construal of the overlap between political and fictional narratives and its unconscious expression of such overlap in terms of racial tension. See Fletcher Knebel and Charles W. Bailey II, *Convention* (New York: Harper and Row, 1964).

[151] Eugene Burdick, *The 480* (New York: McGraw Hill, 1964), vii. Subsequent references in parentheses.

he appears indifferent to political trends. Thatch caters not to the caprices of different voter groups, but to the management of his international construction firm, which throughout the novel lands him in overseas standoffs with foreign governments and third-world political factions. Thatch garners his presidential status through such encounters because his actions appear to the American public as inherent evidence of his possession of political qualities: diplomacy, leadership, but mostly an ability to foil Communist plots. Burdick's characterization of Thatch as naturally presidential surely means to contrast what he saw as Kennedy's artificial construction of a popular image determined by numbers and statistics. At the same time, Thatch's political image, however authentic, must still be communicated to the public by his campaign team, specifically by two men whose names challenge the novel's presentation of Thatch as a political purist. While Bookbinder, the Republican traditionalist, seeks to use Thatch to tell a "believable" story about an American "hero," Madison Curver, "systems analyst," hopes to frame Thatch's public image by information gleaned from digital computations (16, 48). It is this alignment between Bookbinder's fictions and Curver's curves—between political stories and statistical graphs—that Thatch unknowingly enters. The question of differentiating between literary fiction and the construction of both political and statistical narratives, moreover, is already apparent in the preface to the novel, where Burdick's claim of warning Americans about a "conspiracy" of political machines serves to introduce the alarmist paperback political thriller that follows. While Burdick presents the dramatic trajectory of a capitalist turned presidential "hero" as crucial to exceeding the machines of modern politics, he can't help but replace a national conspiracy with a novelistic one. In other words, Burdick's novel construes the probability arcs of political statistics as oddly analogous to the narrative arcs of genre fiction.

A paradigmatic image of Burdick's conflation of fiction and politics occurs early in the

novel in the form of a bridge that Thatch's firm is attempting to construct, an overtly symbolic feat of literally conjoining the borders of India and Pakistan. All that remains of the project is a twenty-foot gap, to be filled by an iron girder, "machined so that it would fit perfectly into the huge slots on either side of the gap" (26). As heightened political tensions arouse military movement on both sides of the bridge, Thatch arrives to find himself and his firm embroiled in a heated international conflict with only twenty feet of unconstructed bridge separating the two sides. Thatch recognizes that he must resolve the dispute and complete the bridge, that the two problems are one; and he reasons that the problem of this border event, with its complicated history and array of socio-political factors, requires an inversely simplified solution. Thatch quickly searches for the form such a solution might take, and he identifies a model for it in the arc of the bridge he has constructed: "It was an artifice. But it soared with inherent beauty. The lines were clean . . . harmonic." Indeed, the arc of the bridge is "the most beautiful man-made thing Thatch had ever seen" (21). Stepping onto the keystone girder so that he is suspended in air by the crane, Thatch begins to "tell a story" (29).

Inspired by the aesthetics of the bridge's "clean" and "harmonic" "lines," Thatch defers imminent violence by reminding his divided audience of a story about when they had come together. Thatch recalls how they had protested the salt tax of British colonial law through a display of political resistance that resulted in the horrific massacre of both Indian and Pakistani protesters by the British soldiers. While telling this story, Thatch is interrupted twice so that the structure of the story is divided into an apparent beginning, middle, and end, fragments conjoined by the traumatic scene of violence. When Thatch moves past the first part of his story and nears the bloody climax, listeners on both sides of the bridge beg Thatch to stop, but he continues. Then again, after the middle of the story, the listeners ask him to stop, and still,

Thatch replies, "Enough? Not yet. For there is an ending" (29). These disruptions mirror what Thatch senses as something "unnatural" about the physical gap disrupting the otherwise beautiful completion of the bridge, and the traumatic pain of his listeners is strangely matched by an aesthetic pain, a sense that "the gap hurt him" (21). The gap, which appears foremost as a metaphor for political conflict—the distance between two groups of people—is also an affront to his aesthetic sensibility. Burdick thus conflates the technological arc and the narrative arc, as it is through the rhetorical device of the story that Thatch intends to mend both the physical bridge and the political divide. As Thatch reasons, mixing metaphors, he "knew the words which could close the gap" (27), and he declares to his audience that he must finish his story so as to "forge the final link" (29). Thatch completes the arc of his story, with his words figured as "the final link," even as he calls for the actual steel girder to be lowered, completing the bridge as well.

In chapter three, I showed how Ralph Ellison's fiction extended the strategies of improbable realism—cryptographic reading and higher mathematics, modes of quantifying the unquantifiable—to denaturalize race, to reveal it as a product of chance, without doing away with its material and numerical realities. In claiming "to give pattern to the chaos" of identity, Ellison enables us to see how the racial logic of quantifying the unquantifiable can also be exploited by a white writer of the program era such as Burdick.[152] While ostensibly critiquing the political reduction of people into statistics, the bridge scene clarifies a more foundational concern dramatized by *The 480*, about the extension of racial demographics to the point of racializing

[152] Burdick receives a brief mention in *The Program Era*, in which Mark McGurl notes that as a young veteran, the author was an early beneficiary of Stanford's ascendant creative writing program run by Wallace Stegner. See 184-87. The secondary literature on Burdick beyond this is incredibly sparse, despite the fact that Burdick authored several bestsellers, two of which were adapted into Hollywood films. In perhaps the only thorough account of these novels, Rupert Wilkinson notes that Burdick represents a disciplinary trend of the postwar years, that "Burdick's kind of realism reflects the advance of the journalist and social scientist into the realm of the novelist." Rupert Wilkinson, "Connections with Toughness: The Novels of Eugene Burdick" *Journal of American Studies* 11.2 (1977): 223-239.

whiteness. There is a familiar Orientalist logic, after all, about the way Burdick constructs a narrative about Indian-Pakistani conflict to justify a moment of Western intervention, thus presupposing Thatch's superiority. More importantly, the form of the bridge—the conflation of the narrative arc with the technological one—suggests that this familiar racist logic, at least in this case, is embedded within a process of narrative formation. Just as the arc of the bridge comprises a Western symbol of postcolonial expansion, "soaring up out of the green jungle, marvelous in its symmetry, a symbolic joining," so must the story that Thatch tells to alleviate the political conflict convey its beauty through dialectical symmetry and aesthetic order as defined by a history of Western poetics, from Aristotle on. For Burdick to present his novel as like the bridge, "the most beautiful man-made thing" his protagonist had ever seen, he must also embrace the technology of his novel. In doing so, *The 480*, this chapter argues, remarkably documents the political triangulation of probability, race, and literary form that appeared against the backdrop of new digital machines.

Novel Projections

The didactic purpose of *The 480*, on its surface, was to warn Americans that individual citizenship was being subsumed into statistical demographics. We can already glean the formation of this political moral in the 1959 volume *American Voting Behavior*, a collection on social science approaches to voting studies that Burdick both coedited with Arthur Brodbeck and contributed to in a chapter called "Political Theory and the Voting Studies." With *American Voting Behavior*, Burdick and Brodbeck addressed, among other concerns, the turn towards

"quantitative methods" in voting studies.[153] As historian Jill Lepore writes, Burdick was "eager to measure the influence of the quantitative turn in the study of man."[154] In the chapter he authored for the collection, Burdick specified his contention that political demography had substituted a mindless "voter" for the rational "citizen" of classical political theory, a difference that amounted to the loss of individual agency.[155] As an example, Burdick questioned a study that illustrated its findings with a probability arc (Figure 6). The image illustrated the study's conclusion that, in short, demographics offer a solution to the problem of quantifying the complex web of American politics. While the voting behavior of a small minority constituted the statistically rigid poles of absolute certainty (1) and uncertainty (0), most Americans fell somewhere between, underneath the "nicely modulated bell-curve" of the arc, which Burdick portrayed as aesthetically alluring: "the pleasing symmetry of its arc—its utter lack of jaggedness."[156] The reliable calculations of statistics showed that most voting Americans, while individually unpredictable, tended to vote in accordance with their demographic group. Thus, the image symbolically managed a complex facet of reality, bringing mathematical order to political chaos. More importantly, it presented Burdick with an aesthetic form that would emerge in his

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[153] Eugene Burdick and Arthur J. Brodbeck, "Introduction" in *American Voting Behavior*. Ed. E. Burdick and A. Brodbeck (Glencoe, IL: The Free Press, 1959), 6.

[154] See Jill Lepore, *If Then: How the Simulmatics Corporation Invented the Future* (New York: Liveright, 2020), 37. Lepore adds that Burdick's Contemporary Political Theory course at Berkeley began with the topic "the crisis in method." "Political theory was on the wane," she writes, "quantification on the rise" (31).

[155] See Burdick, "Political Theory and the Voting Studies" in *American Voting Behavior*. Ed. E. Burdick and A. Brodbeck (Glencoe, IL: The Free Press, 1959), 139. Whereas political theory, Burdick argued, proposes the rational individual's ability to make decisions for and about the political process, the "voter" of political statistics appears predetermined to act in accordance with a demographic. "If rationality," Burdick claimed, "is defined merely as the possession of the information necessary to make a decision, ratiocination on that information, and the *self-conscious* evolution of a decision, the voter is, by and large, not rational (139, emphasis in original).

[156] Ibid., 141-2.

subsequent novel through the idea that "the most beautiful man-made thing" could be encapsulated in the form of a story.[157]

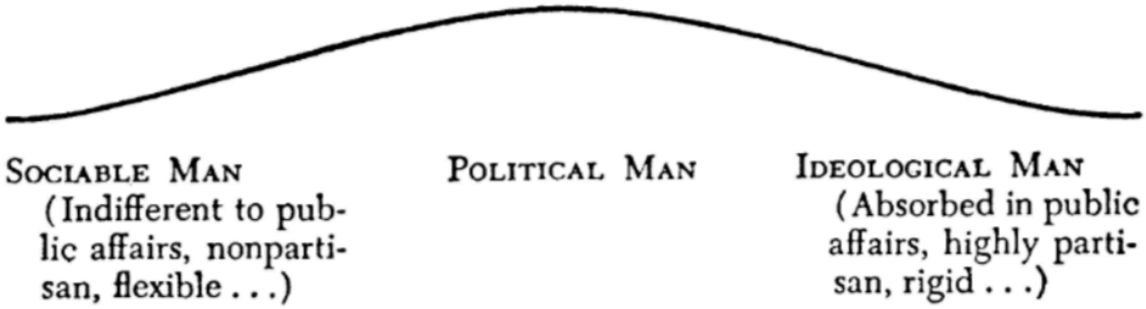

Figure 6: The arc of 'political man'from Bernard R. Berelson, Paul F. Lazarsfeld, and William N. McPhee, Voting: A Study of Opinion Formation in a Presidential Campaign *(Chicago: University of Chicago Press, 1954), 323*

Figure 7: Section divisions resembling punch cards, from Voting *(1954) on the left and* The 480 *(1964) on the right.*

[157] This is to make a similar observation as Roland Végsö in his reading of *The Ugly American* (1958). Végsö argues that Burdick aestheticizes a political view that his novel is meant to critique so as to maintain his fiction's middlebrow realism and thus resist the associations of high-brow modernism. See Roland Végsö, "The Importance of Being Ugly: Anti-Communist Anti-Imperialism" *Comparative American Studies* 6.3 (December 2008): 374-387. Burdick's aesthetic orientation makes him the most recognizably realist postwar author in this dissertation, which also makes his novel a useful case study for demonstrating the limits of a realist mode that I have identified with late modernist writers such as Nabokov, O'Connor, and Ellison. In a coda, I examine further how Burdick presents such limits as they spill over into the reign of more decidedly postmodernist authors such as Thomas Pynchon.

In his essay, Burdick explained that his complaint with the image was that it underwrote a deceptive conception of statistical groups as real phenomena, rather than constructed tools for political theory. In Burdick's sense, the probability arc in the study made a scientific invention, mere "categor[ies] for lumping 'variables,'" look like something "real and concrete." In other words, the arc facilitated an illusion in which "abstract categories [hypostatized] into concrete collectivities."[158] In short, Burdick criticized social scientists for inverting scientific models with reality. Yet even as he expressed reluctance to accept the abstraction of complex reality into a false image of simple probability, Burdick's fascination with the "nicely modulated bell-curve," his description of the arc's "pleasing symmetry" and "utter lack of jaggedness," indicate his sense of the aesthetic potential of this particular form to traverse the gap between fiction and reality. When Burdick turned from his essay in *American Voting Behavior* to a new fictional project that would become the novel *The 480*, it is clear that the visual allure of the statistical arc influenced his portrayal of a bridge "soaring up out of the green jungle, marvelous in its symmetry, a symbolic joining." Indeed, the desire to visually blur the distinction between fiction and reality was advanced by another visual strategy he borrowed directly from the voting study. In the 1954 study, Burdick and his co-editor structured their section headings with an image meant to denote the boxes of a ballot card, with one box marked with an X to signify a cast vote. To separate the chapters of his 1964 political thriller, Burdick modified the idea so that the chapter headings resembled not analog voter cards but digital punch cards (Figure 7). As with the architectural metaphor of the probability arc, this technique for structuring the novel suggests an absorption of computation into Burdick's aesthetic strategies, a sign that his novel was becoming the digital machine it was meant to critique. By transposing the "pleasing symmetry" of a probability curve into the "marvelous […] symmetry" of a metaphor for narrative itself, Burdick

[158] *American Voting Behavior*, 143.

conveys how the inherent beauty of his novel derives from its mathematical integrity.

Burdick's concern with literature succumbing to the digital expresses itself most forcefully through a character named to suggest the conditions of literary production. Bookbinder, or Book to his friends, represents the old guard of traditional politics, an era in which campaigning meant storytelling, crafting for the public a narrative that presented "a real believable hero" (16). If Book's virtue involves the construction of human narratives, the binding together of political heroes, his new partner, Curver, thinks too much like one of his machines. Already a victim of switchbox thinking, when "Curver thought," "forms flickered through his mind, there was a whirring and then . . . quite suddenly . . . he had it . . . an IBM card in his mind" (127). Bookbinder discovers the wonders of Curver's machines for himself while at Simulations Enterprises, the corporate center of Curver's operation and the fictional counterpart to the real Simulmatics Corporation. Dr. Devlin, Curver's behavioral psychologist, introduces Book to a room of grey towers that constitute the "IBM seven-oh-nine-four Computer" (78). Confronted with the full force of the digital sublime, Bookbinder admires the "beautiful" machine, colorful and "mesmerizing" with its reels of magnetic tape that hypnotize him with their incessant and mechanical spinning, leaving him in a state of "dizziness" (78-79). Later, Bookbinder worries, "that he was like Dr. Devlin's 7094 machine . . . Taking whole ideas and instantly reducing them to bits of information on a tape which flicked meaninglessly across his mind (137). Book transparently conveys Burdick's own skepticism about the postwar status of the novel, though more importantly, Book situates such doubt in the context of the emerging digital age.

As the plot progresses, Thatch continues to gain political popularity, aided by the statistical analyses of Curver's machines. As a result, Bookbinder's sense of the digital sublime

turns into something more ominous. Book realizes that the socioeconomic groups they are sampling and analyzing "did not really exist. They were imaginary, fictitious, used like zero is used in arithmetic. Yet real flesh-and-blood people would respond like—like automatons?" (81). Here, again, we have the moral conundrum that Burdick had earlier addressed in *American Voting Behavior*. The field of political statistics inverts the relationship between reality and representation. Rather than produce voter data that reflects some aspect of reality, as the field had attempted in the past, actual American citizens—"real flesh-and-blood people"—instead appear to act in accordance to digital forecasts. The machines project a political narrative, that which is "imaginary" and "fictitious," onto reality, in a manner that for Bookbinder seems to confuse the relationship between fiction and reality, leaving him with "the sharp sense of unreality": "Unreal people were being asked invented questions and a result came out on green, white-lined paper . . . and when you got around to the real people six months later with the real questions they would act the way the computer had said they would" (84). The captivating allure of Curver's IBM machines arouses Book's fears that they have unleashed a source of political power that will inevitably outstrip their ability to control it, an idea that culminates with the recent memory of Senator McCarthy, who rises from the grave in the novel's final paragraphs to haunt Book's own premonition of the future, like the walking dead of American politics: "McCarthy's hyena face and nervous laugh and evil eyes invaded Bookbinder's mind and he imagined the dead Senator standing with him at the Simulation Enterprises office on Madison Avenue and watching the tapes and spools and lights and buttons and planning some masterful manipulation of the American public so that it would embrace his kind of madness" (309). Bookbinder thus becomes a mouthpiece in the novel for Burdick's own moral warnings about what he perceived as the dangers to democracy of introducing statistical computation into the

political process.

At the same time, this instance of political moralizing on Bookbinder's part repeats the aestheticization of mathematics that first occurred at the bridge. It is, after all, the idea of fiction, the production of a "fictitious" and "imaginary" narrative that Bookbinder compares to "zero," as it "is used in arithmetic." The idea of probability mirrors the basic functioning of the novel, as both attempt to project an image of reality into the future, rather than merely reflect reality as it is. This is why, in a novel that ostensibly warns the American public about the encroaching political threat of digital machines, Burdick chooses to punctuate his chapter headings with binary punches. The images construe each chapter as a sequential series of Fortran punch cards, precisely because of the imposition of authority that accompanies Bookbinder's sense of the digital sublime. "Fortran," he thinks, "God, that word has a ringing authoritative sound to it—like *Sergeant!*, or *Snap to!*, or *Attention, men!*" (81). In other words, like Bookbinder, the book itself takes steps towards becoming a machine in order to enforce its verisimilitude. Summoning the power of digital metaphorization, Burdick earns his novel the very inversion of fiction and reality his character decries, precisely so as to validate the political moral that Burdick himself admits "is entirely a projection by the author," that is, a simulated narrative that takes the data found in the "political realities of today" to probabilistically forecast "the political hazards of tomorrow" (x, xi). Burdick endows his novel with the triumphant aura of a digital simulation to render it successful, that readers might more readily heed its warnings than avert their attention to "the tapes and spools and lights and buttons" of the digital age. To accentuate an otherwise quotidian political narrative, Burdick presents his novel as the merging of mathematics and aesthetics: a probabilistic narrative predictive of a future technological reality.

Just behind the Skin

Perhaps the chief sign that Burdick attempted to assign his novel the cultural authority afforded to new digital machines, and that in doing so he confused fiction with reality, was that his literary attack on the Simulmatics Corporation, the actual entity providing Kennedy with voter data in 1960, drew into debate the company's lead researcher, Ithiel de Sola Pool. Prior to *The 480*'s publication, Burdick knew de Sola Pool as a statistician who had contributed a chapter to the 1959 collection on American voting studies that Burdick coedited.[159] After the publication of *The 480*, de Sola Pool took up the mantel of literary criticism to review the novel that threatened the reputation of his work. In his review, de Sola Pool complained about the conflation of fiction and reality. The novel's "claims of phenomenological realism," he argued, "leave a reviewer in a dilemma, for what he would otherwise review as an amusing novel . . . he must now, at Burdick's insistence, review as a political science document."[160] De Sola Pool deployed his status as a leading computer scientist to castigate Burdick for the imprecision of technical detail and the obfuscation of the role computers played in the political process. But the review's most scathing criticism of *The 480* left political science behind to suggest in literary terms that the overdetermination of scientific reality ultimately damaged the novel's aesthetic success. "A valid subject for a novelist writing on power and organization," de Sola Pool wrote, "is the evolution of character"; but in their narrow focus on the evils of digital machines, Burdick's characters appear "too flat, too deficient in development, to permit him to study the

[159] In addition to de Sola Poole, Burdick also worked closely with Ed Greenfield and Harold Lasswell, who would go on to found Simulmatics, while at the Center for Advanced Study in Behavioral Sciences. While outwardly critical of the Simulmatics Corporation, Burdick shrewdly avoids mentioning his affiliations with the company in *The 480* or elsewhere. See Lepore, 32.

[160] Ithiel de Sola Pool, "Fantasy and Reality" *New Leader* 47.18 (1964): 28.

human problems of large organizations."[161] Presumably, de Sola Pool desired a more accurate representation of scientists such as himself who grappled with the moral compromises of their work even as they hoped to contribute positively to the political process. But such psychological depth seems to be precisely what Burdick delivered through characters such as Bookbinder, who is provided ample time in the novel to ruminate about the human cost of computers in American politics, especially in the hands of McCarthy-like manipulators.

The irony of de Sola Pool's attempt at literary criticism, his complaint of "flat" characters, is that Burdick most thoroughly flattens not the scientists at the novel's center, but those characters, lingering at the periphery of the novel, that de Sola Pool likewise neglects:

> "Boss, that man is boss, like no man is boss," a Negro yelled. "That man no chicken. He don't back down when he say somethin'. Hey, Boss, look over here, Boss." (284)

Such nameless, faceless voices populate the outskirts of *The 480*, ostensible representatives of the voting groups that Thatch fights for, the very groups the novel claims to undo. Instead, they dissolve into stereotypes—"a Negro," "the doorman," "a Communist"—minority groups rendered as minor characters, fictional statistics congruent with the list of demographics printed in the novel's appendix. The only role such characters serve is to support the novel's more central players, for example, to accentuate Thatch's status as "boss" or "no chicken," by offsetting him from the marginalized groups limited to the novel's perimeter. Burdick may have lamented the loss of individual political agency to statistical groupthink, yet he found such statistical categories necessary to elevate his protagonist above the mass of nameless characters that populate the perimeters of a novel: "at a certain point the people joining a crowd lost their identity, became expressionless, were like identical units which only added mass but no individual to the crowd. *Only Thatch, big and unsmiling, stood out . . . a nucleus around which*

[161] Ibid., 30.

the scurrying senseless faceless units moved" (287, emphasis added). This explains the novel's messy geopolitics, that is, why Thatch earns his status as a United States presidential candidate while traveling to the remote corners of the global south. Thatch's sense of authority, which the novel conveys as heroic, derives from a commanding presence over the people of color native to underdeveloped countries exploited by his corporate enterprises: the Nepalese Gurkha he saves as the novel opens, the Indians and Pakistanis he reconciles at his construction site, the Japanese imperialists he liberates from a Communist plot. "Thatch, boy hero," one headline reads, "threw back the Huks in the wilds of Zamoanga" (200).

For Thatch's narrative to rise like the arc of his bridge, there must be a "jungle" from which it appears "soaring up out of"; but beyond figuration, the dynamics of race and racism provide Burdick not only with the metaphorical poles of the probability arc, but also with actual vectors of certainty and uncertainty to explore in the novel. For example, both de Sola Pool and Burdick identify the predictability of racism in the early 60s. De Sola Pool denies that his science meddles with the future by pointing out the obviousness of some demographic data. It didn't take a computer, he reasons, to understand that "Kennedy would . . . lose bigot votes."[162] Likewise, in Burdick's novel, Curver acknowledges that racism "doesn't call for a simulation" (218). While demonstrating the power of his machine to a group of politicians, Curver readily admits the predictability of certain groups, such as "Southern, wealthy, urban, professional, third-generation." The politicians need no simulation to anticipate the issues their candidate would avoid in talking to such a group—civil rights, integration, etc.—because they agree that racism is predictable. In such claims, the inevitability of racism on the American political stage features like one of the poles in Burdick's graphing of a probability arc. That is, racism offers a known variable, an element of reliability. But what, in this schematic, comprises the opposite pole?

[162] De Sola Pool, 30.

"Curver smiled," the novel tells us, in response to the confidence of the politicians. "You didn't give me time to add the last adjective," he pauses, "It was *Negro*." The putative joke, insinuated by Curver's smile, is that for the white, conservative politicians, race itself remains a variable of unpredictability opposite the surety of racism. Curver's pitch is that by taking the elements they know, such as the predictability of white, southern, bigots, they can work towards likely predictions about what they don't know: "you take their behavior on past issues and you run this through a computing machine and you come up with an analysis of where they stand" (51).

While in the past, the political behavior of ultra-minority groups, such as upper-class African Americans, remained a mystery to white politicians, Curver insists that his computer can piecemeal the complexity of small data points together to create a viable prediction, thus lifting the veil. "They can simulate," he explains, "how the group will act before the group has even heard of an issue" (52). In a moment of blurred historical realism, Burdick's character reveals that Kennedy used computers for such an end in 1960, that his campaign managers "got out their tapes and fed them into the computer. They found that the Negroes had shifted … transferred their allegiance" (54). The computers thus produced a "symbolic imitation" of the racialized mystery at the heart of American politics (57). To the computer scientist and novelist alike, race and racism, like the poles of the probability arc, represent certainty and uncertainty, zeroes and ones.

The narrative logic of *The 480* thus depends on a double bind, in which race represents something both knowable and unknowable, quantifiable and unquantifiable, a dialectical oscillation that provides the basis for the novel's central narrative. Thatch, the subject of this narrative, reinforces the process when he speculates about the amount of Filipino blood his wife Terry possesses. "It was probably a small amount," he reasons, "something just behind the skin"

(41). Thatch, who vehemently claims his wife's racial background is insignificant to him, hesitates to speculate about the possibility of quantifying race, not as it presents itself visually, but as it exists, "just behind the skin." The moment suggests, on the one hand, something ineffable about his wife's racial makeup, further mystifying the idea that race transcends physiology to lodge itself somewhere more essential. Yet the thought is triggered by a southern senator whose racist question to Thatch summons an old, though apparently not obsolete, racial yardstick: "Is your wife a Malay quadroon?" (208). The question reminds us that, long before Kennedy's 480 demographics, quantification described the various racial constitutions of only the most marginalized persons in the country.[163] In drawing from the history of quantifying race, Burdick surely affirms what he sees as the dehumanization achieved by a political process that turns citizens into voters, people into numbers. Thatch's moment of weakness nearly asks if the country shall repeat the strategies of slavery. But Burdick's own strategies confirm that such angst over the perils of quantification amounts to a specific anxiety about the racialization of whiteness. The political horror conveyed by *The 480* is not, as stated in the preface, that every demographic now counts as but one among many, but that white Americans—particularly white men like Thatch—should be incorporated into a statistical classification system originally constructed for their benefit. Burdick's attempts, then, to fashion *The 480* into the image of a digital machine, do not finally register as mere marketing ploys developed under the cultural logic of late capitalism or the programmatic demands of postwar creative writing, except in so much as such mechanisms are understood as expediting a more fundamental project of dramatizing the social dimensions of race in American politics.

[163] On modern quantification's roots in the mathematics of colonialism and slavery, see Jennifer L. Morgan, *Reckoning with Slavery: Gender, Kinship, and Capitalism in the Early Black Atlantic* (Durham: Duke University Press, 2021).

CODA: FORMAL (ARC)HAEOLOGY

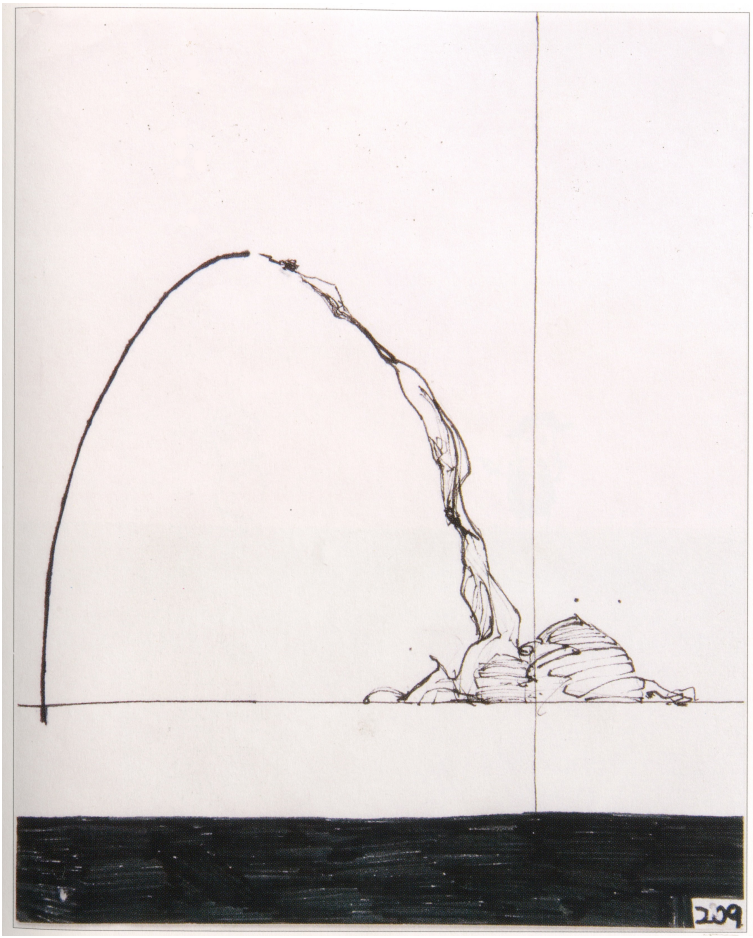

Figure 8: The rocket's arc, from Zak Smith, Pictures of What Happens on Each Page of Thomas Pynchon's Novel, Gravity's Rainbow, *Walker Arts Center, 2004.*

An impetus for this dissertation several years ago was my skepticism of James Wood's claim that because Thomas Pynchon's postmodern plots are too "improbable," that they fail on aesthetic grounds.[164] The cartoonish dynamics that structure Pynchon's literary worlds certainly merit Wood's accusation of "hyperrealism," an absurd acceleration of realism's internal

[164] See James Wood, "Human, All Too Inhuman" *New Republic* (July 24, 2000). Web.

dynamics to the point that "information has become the new character." But I suspected that the improbabilities of Pynchon's novels pointed to a more interesting problem, both historically and formally, than the mere demurral of Aristotelian aesthetics, and Wood's complaint about "information" seemed to unknowingly point to an answer.[165] In *Gravity's Rainbow* (1973), Pynchon drew attention to the dynamics Wood identifies by organizing the first half of the novel around the ascending accretion of information—Slothrop's detective narrative turned conspiracy—while the second half of the novel descends into ever more unlikely levels of chaos, as the plot becomes overburdened by the proliferation of new intel. In a Pynchonian joke, the plot structure of the novel finds expression in what it frequently describes as the arc of a Nazi rocket's path (Figure 8). According to the novel, German scientists termed the apex of this arc *Brennschluss*, the point that marks a threshold between the techno-scientific knowledge "programmed" into the rocket's ascendance and the moment when "something else has taken over. Something beyond what was designed in."[166] By turning this material form, which hinges on the difference between design and chance, into the form of his novel, Pynchon also knowingly formalized the first law of communication theory, as elaborated by Claude Shannon, that as information increases, entropy increases.[167] The implication is that in gathering too much

[165] More than a passing reference to Aristotle, Wood's concern about improbability is part of what the critic sets out elsewhere as a "reexamination of Aristotle's original formulation of mimesis, in the *Poetics*." See *How Fiction Works* (New York: Farrar, Straus, Giroux), 237. Wood writes, "Hypothetical plausibility—probability—is the most important and neglected idea." "Probability," he explains, "involves the defense of the credible *imagination* against the incredible," in which the burden of "mimetic *persuasion*" falls on the artist to convince the reader that "this could have happened" (238). Wood's insistence that probability binds together a common audience that consents to the believability of narrative has troubling resonance with what this coda examines as a history of nationalist impulses behind these very ideas.

[166] Thomas Pynchon, *Gravity's Rainbow* (New York: Penguin, 1973), 226.

[167] Lance Schachterle offers a thorough examination of Pynchon's interests in informational entropy, though he does not address *Gravity's Rainbow* and the form indicated by its title. See Lance Schachterle, "Information Entropy in Pynchon's Fiction," *Configurations* 4.2 (1996): 186-214.

information, Slothrop exposes a conspiracy so vast that it threatens the narrative coherency of his very existence, thus explaining his disappearance at novel's end. As we saw in chapter three with Ralph Ellison's critique of cybernetics, individual identity cannot stand against the onslaught of information—the difference that makes a difference—without a balancing of collective, demographic sameness. As Pynchon knew, the form he made coextensive with both his novel's plot and a rocket's path, is the same as that devised by Shannon to illustrate the entropy of information: a bell curve, or Shannon's arc, a coincidence missed by the many readers of *Gravity's Rainbow*, yet captured by its very title (Figure 9).

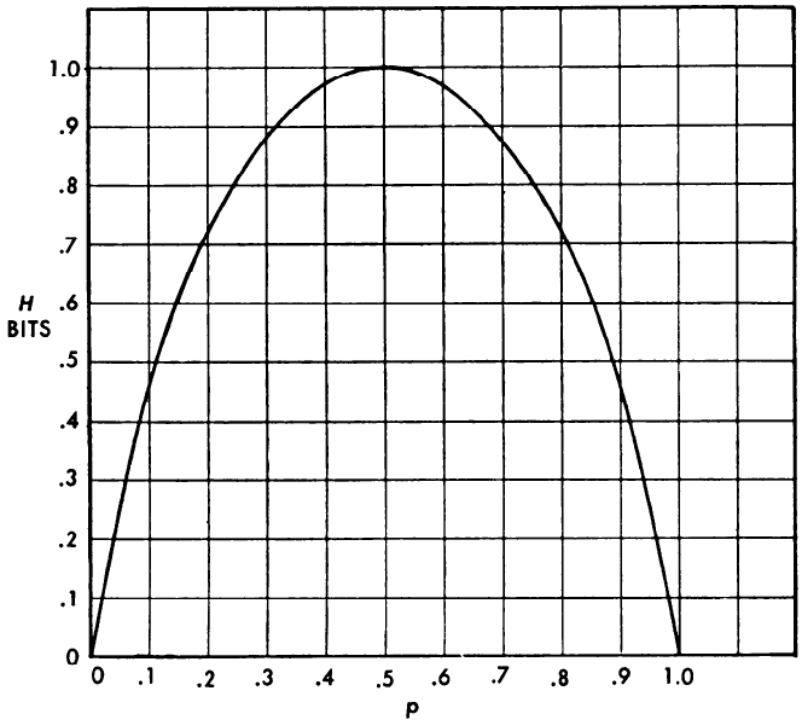

Figure 9: The arc of information, from Shannon and Weaver, The Mathematical Theory of Communication *(Urbana: University of Illinois Press, 1964), 50*

Like Eugene Burdick, Pynchon also turned to the form of the arc for aesthetic inspiration. In choosing the arc, moreover, Pynchon—as with Burdick—dramatized how literary form might

coincide with a racial logic. Specifically, *Gravity's Rainbow* presents the Nazi pursuit of rocketry as synonymous with the regime's belief in racial superiority. In the novel's final moments, as the rocket descends in a section entitled "Descent," the conceit behind the technology of the V-2 appears as an escape from the category of race:

> "…what is this death but a whitening … a carrying of whiteness to ultrawhite, what is it but bleaches, detergents, oxidizers, abrasives … extending, rarefying the Caucasian pallor to an abolition of pigment, of melanin, of spectrum, of separateness from shade to shade, it is *so white that*…" (774-5).

In *Gravity's Rainbow*, the dream of the Nazi rocket is the dream of erasing difference, a "rarefying" of whiteness to the degree that it reads not as one color among many, but as color's absence, "an abolition of pigment." Alarmed by the abstraction of whiteness as a hole on a punch card, Burdick asserted a protagonist to restore white identity to a place beyond identity. Ostensibly exceeding the 480 demographics, the whiteness implicated in Burdick's novel shares an ideological goal with Pynchon's metaphor of the rocket arc: to transcend the statistical technologies of racial measurability. What should we make of this coincidence? It would be tempting to identify both authors as contributing to what Mark McGurl terms technomodernism, the "unmarked dialectical reversal" of multicultural pluralism. To compete within the pluralistic postwar literary market, white authors, according to McGurl, frequently deployed technical knowledge through experimental prose as a strategy of simulating racial or ethnic difference, a "non-ethnic ethnicity."[168] In this dissertation, I have argued that in the immediate years prior to Pynchon, Barth, or McGurl's other exemplars of technomodernism, the overlaps between postwar novels and digital media emerged not as realism's "unmarked dialectical reversal," but as an affordance of realism's own formal capabilities, especially according to a rubric of plot, as exemplified by Burdick's popular thriller. It remains to be seen, however, if experiments such as

[168] See McGurl, pages 62-3.

Pynchon's are part of the same literary mode I have described as improbable realism. If so, does Pynchon's novel indicate improbable realism's formal extension? Acceleration? Obliteration? Answering these questions requires further excavation of the form of the arc that links them, a formal (arc)haeology, so to speak, to clarify the contemporary status of improbable realism.

Gravity's Rainbow confirms that by the mid-twentieth century, the arc designates a conceptual apparatus for representing both scientific and aesthetic narratives. While we might trace this form back to arcs both architectural and metaphorical of previous eras, it is the nineteenth century that witnessed the emergence of the narrative arc we find in postwar culture. Gustav Freytag first elaborated a pyramid shape or arc as the quintessential form of dramatic action in *Die Technik des Dramas* in 1863 (Figure 10); and the phrase "narrative arc" hence attributed to Freytag's schematic has not only shaped the study of narrative throughout the American education system, it has also entered into popular discourse as an expression for discussing character development and the trajectory of diegetic events.[169] Freytag's division of dramatic plot into five acts—introduction, rising action, climax, falling action, and resolution—aspires toward a degree of objectivity meant to grant Freytag's German philology with the aura of scientific analysis. Yet in *Die Technik* Freytag attached this form to his own political commitments. Freytag saw the attainment of strict aesthetic ideals as linked to the formation of a strong German national identity. Nowhere is this more evident than when he discusses that chief dictum of Aristotelian poetics that Wood also invokes in his critique of Pynchon: "*The action of*

[169] For this reason, Freytag's novels were required reading for the Hitler Youth. More surprisingly, his ideas, as Nancy Glazener shows, became ingrained in the literary education of American youth. Freytag's pyramid, even by the early twentieth century, was being published in English without credit, such that it became, according to Glazener, a "self-evident apparatus" and "instructional fixture" of American education programs. The institutionalization of Freytag's schematic design continues today in U.S. secondary textbooks that include sections on "plot." See Nancy Glazener, *Literature in the Making: A History of U.S. Literary Culture in the Long Nineteenth Century* (Oxford: Oxford UP, 2016), 190.

the serious drama must be probable."[170] For Freytag, Aristotle's commandment about poetic probability implicated a set of "social" concerns. Probability, according to Freytag, assumes a common audience. The question of aesthetic probability is thus adjudicated by the author's responsibility to his "race," to keep to what is familiar enough that an audience of fellow citizens might establish a consensus of likely verisimilitude. Ralph Ellison may have agreed that "literature is the voice of a group." But Ellison's part in the postwar turn to improbable plots shows how that voice, having accepted its belonging to a group, can also speak beyond such confines, communicating on the lower frequencies that transcend difference. For Freytag, however, straying beyond racial consensus not only ruins the aesthetic integrity of the work of art, it also diminishes national culture as a whole. It is in this sense that Freytag writes that fiction's laws of probability preclude the "distraction" of "presenting such strange peoples as stand entirely outside the great forward movement of civilization"; an author must avoid, according to this logic, "that which is unusual in their manners and customs, their costumes, or even the color of their skins."[171] When Burdick presents his protagonist, Thatch, as erecting a monument to the beauty of the narrative arc, he does so within the context of a white hero, whose bridge, as with his story, might be distinguished from the messy foreign politics happening in the jungles of the global south. In doing so, Burdick's novel reinforces Freytag's sense that if fictional verisimilitude is guided by probability, then probability in turn supports a racial logic in which well-constructed narratives elevate the humanity of white, European characters—and, by extension, a national audience of white readers—over racial and ethnic others.

[170] Gustav Freytag, *Technique of the Drama* Trans. Elias J. MacEwan (Chicago: Scott, Foresman and Company, 1894), 49, emphasis in original.
[171] Ibid, 54.

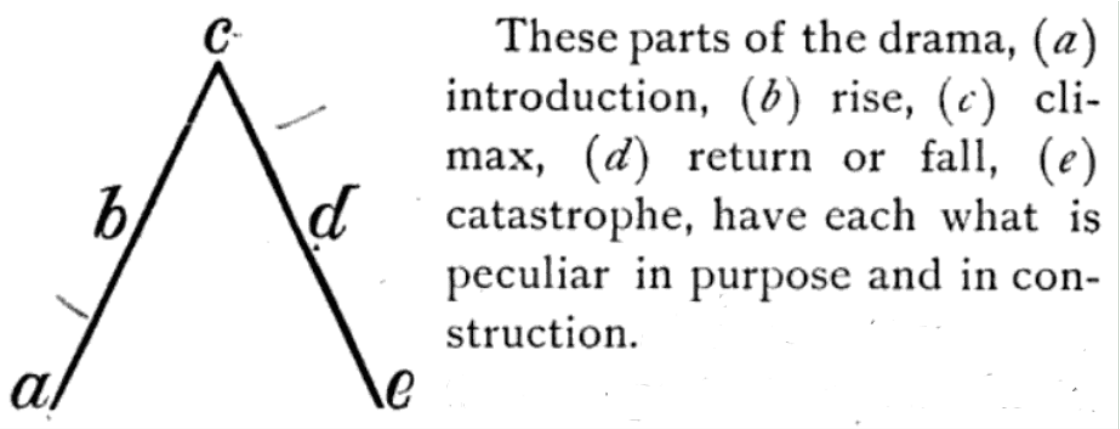

Figure 10: Freytag's Pyramid, from Technique of the Drama, 102.

Even as Freytag wrote, the statistical revolution of the nineteenth century also established the form of the arc as an expression of a chief mathematical discovery: the law of normal distribution or standard deviation. As the century drew to a close, Sir Francis Galton, who had little to do with the mathematical elaboration of such laws, was nevertheless a chief observer of their aesthetic appeal. In *Natural Inheritance* (1889), Galton wrote, "Whenever a large sample of chaotic elements are taken in hand and marshalled in the order of their magnitude, an unsuspected and most beautiful form of regularity proves to have been latent all along . . . a flowing curve of invariable proportions."[172] Galton invented a series of devices capable of mechanically presenting the probability arc (Figure 11):

[172] Francis Galton, *Natural Inheritance* (New York: Macmillan, 1894), 66.

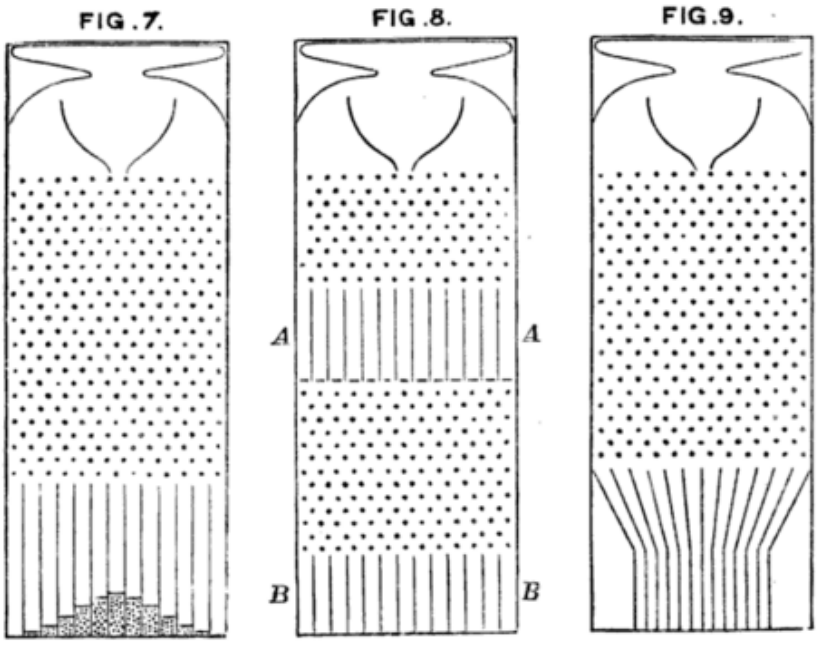

Figure 11: Various Galton boards from Natural Inheritance, *p.63.*

Known as Galton boards or quincunx devices, these media objects ostensibly modeled the hidden laws of chance, as small objects, usually beans, were funneled through the top to bounce randomly through a grid of metal pins.[173] As the items settled into columns at the bottom, an arc took shape—no matter how often the experiment was repeated—in a material representation of the average dispensation of large numbers, or what amounts to a physical manifestation of a visual metaphor. Certainly, Galton's fascination with the aesthetics of the arc anticipates Burdick's description of the bridge, as both are construed as "beautiful" because regular, invariable, symmetrical, etc. More crucially, just as Freytag had linked the arc's aesthetic qualities to a fierce nationalism, the Galton board and its attendant aesthetics consolidated Galton's aspirations for racial purity. The device was critical to Galton's establishment of eugenics, since the quincunx demonstrated "regression toward mediocrity," a natural buffer against evolutionary progress that Galton believed required a counterforce in terms of social

[173] Ibid, 63-66.

control.[174] To Galton, the basic form of a probability arc illustrated how the controlled direction of "mediocrity" depends on the minimization of genetic traits that are both unwanted and peripheral, so as to encourage the strength of the human species, represented by the ascendent bell curve, that ever rising apex. Relatedly, Pierre Teilhard de Chardin chose an arc as the figure for his concept of the Omega Point in *The Phenomenon of Man*, which Flannery O'Connor read while composing *The Violent Bear It Away* (Figure 12). In fact, the title of O'Connor's second collection of short stories*, Everything That Rises Must Converge*, derives from Teilhard de Chardin's summary of the Omega Point as the teleological event in which the advances of biological evolution coincide with divine will, thus attaining the perfection of the human species. The arc that emerges from this mystical theory evokes the rocket arc of Nazi science, a vested interest in eugenics expressed by Teilhard de Chardin's remarkable, if horrifying question: "Monstrous as it is, is not modern totalitarianism really the distortion of something magnificent, and thus quite near to the truth?"[175]

[174] The link between eugenics and the discovery of the probability arc was made explicit in Galton's 1907 lecture, "Probability, the Foundation of Eugenics," a capstone summary of his life's work. See Francis Galton, *Probability, the Foundation of Eugenics* (Oxford: Clarendon Press, 1907).

[175] See Teilhard de Chardin, *The Phenomenon of Man*, 257.

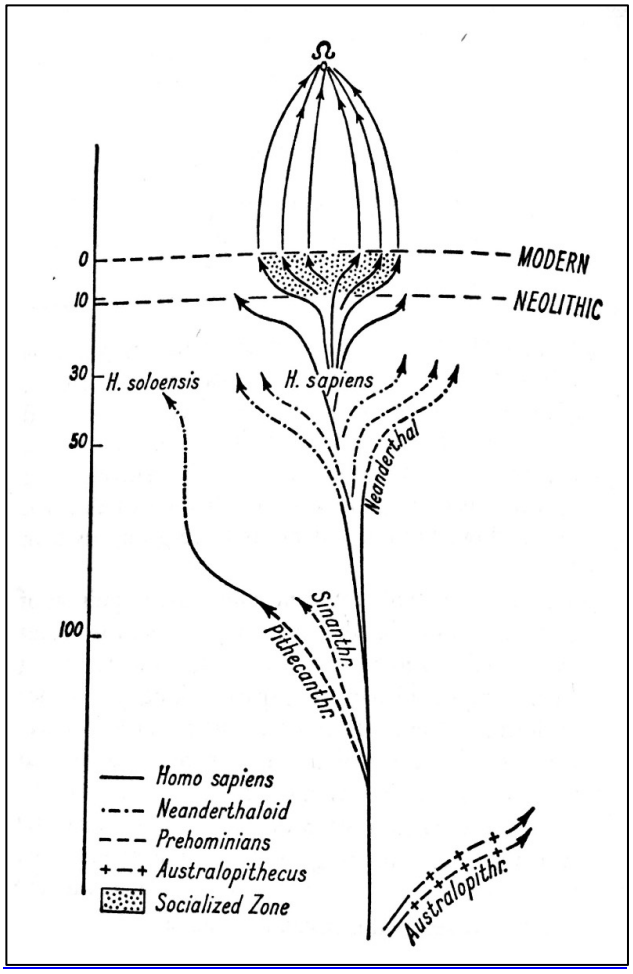

Figure 12: The Omega Point. Source: *The Phenomenon of Man.*

Teilhard de Chardin's question indicates a midcentury revival of nineteenth-century investments in literary and mathematical probability, though now prompted by advancements in digital computing power that seemed to quantify the previously unquantifiable. If Burdick's bestseller marks a literary popularization of these interests, it is telling, finally, that *The 480* was published in 1964, the same year that the New York World's Fair should feature an enormous installation of Galton's device. Though invented at the turn of the last century, the mathematical apparatus so neatly illustrated the process of computation, the very logic of digitality, that the device was displayed to audiences as "The Probability Machine," part of a pavilion hosted by

I.B.M. to help educate American audiences about the workings of new digital machines.[176] Every few minutes, the machine would let loose a cascade of 15,000 polyethylene balls that descended into columns at the bottom as they bounced off of a grid of metal pins. The effect was to show audiences how the random movements of the balls nevertheless formed a neat and rounded probability curve every time the experiment was carried out. What Galton had once imagined as the form that authorized social control and genetic manipulation, audiences bore witness to as a continual loop of digital logic. The image printed in an I.B.M. press release of a boy, staring up, frozen in place, as a cascade of balls, bouncing through a series of binary pins, transforms into an aesthetically pleasing continuous arc is a close enough analogue of the mathematical sublime—now externalized by a probability machine—that Pnin experiences through his wallpaper as "aesthetic bliss" (Figure 13).

[176] See "Press Release: From / IBM (1965)." *New York World's Fair 1964/1965*. http://www.nywf64.com/ibm14.shtml. Accessed June 8, 2021.

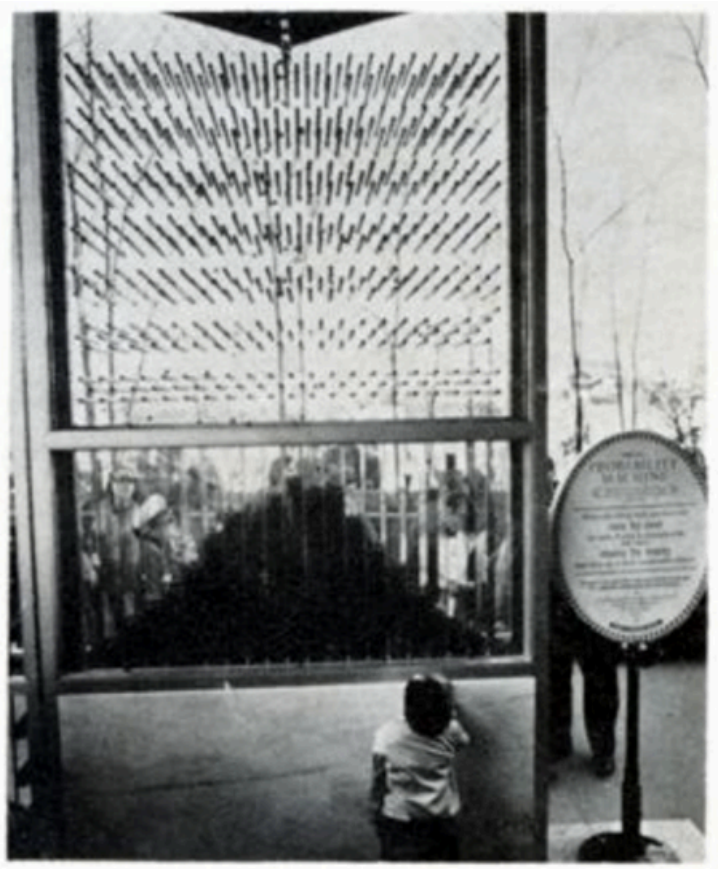

Figure 13: The Probability Machine. Source: "Press Release: From / IBM (1965)"

Between rhetorical and technical meanings native to literary theory, mathematics, communication theory, and eugenics, not to mention German philology, French mysticism, and U.S. pop culture, the form of the arc that emerges from these brief sketches elaborates a longer, transcontinental development of cultural significance that brings into perspective a moment in American literature that occurs between World War and World's Fair. On the one hand, the form of the arc in these examples appears structurally and epistemologically requisite to the emergence of digital media in that moment—if the digital is understood as a mode of representation, one engaged with processes of quantifying the unquantifiable. On the other hand, the link to eugenics from Freytag to Galton, often underwriting an ideology of white supremacy, demonstrates a political project that these novels resist, justifying their turn to sheer

improbabilities. Freytag, Galton, and even Teilhard de Chardin, fixed their eyes on the apex of their arcs, revealing a nineteenth-century fascination with statistical averages and "the taming of chance" that produced what historian Sarah Igo describes as a midcentury fascination with "locating a definitive midpoint in an infinitely heterogenous nation."[177] At the same time, these postwar novels clarify how the logic of probability—the very dictates of fictional quantification—actually brings into focus the utter margins of human expression. Just as the "almost feminine" Pnin surfaces an entire system of gender dynamics by virtue of his placement between the poles of masculine science and feminized humanities, so does Tarwater and Guy efface midcentury masculinity through their submission to the most unlikely actions of their women authors, the same as Ellison's protagonist asserts a minority individualism by falling in step with chance. From the outset, I have sought to examine postwar realism, not to strip it of its associations with the social and political urgency of questions of identity, but to determine the formal capacity of realism itself to enable such questions to emerge. I believe that looking closely at these many arcs allows us to see that form, the form of postwar realism.

What I have termed improbable realism broke into cultural consciousness, and thus literary history, through the sheer ambition of *Gravity's Rainbow*. Pynchon's literary experiments ushered in the apotheosis of a form that his proclivity for exaggeration simultaneously obliterated—an embodiment of a probability arc diffused to the point of unrecognizability, traceable only through the set of stylistic attributes we can but describe as Pynchonian. Pynchon's novel, with its innumerable characters and improbable plot points, shows signs of Nabokov's cryptographic reading, O'Connor's higher mathematics, and a racial logic of probability that exists somewhere between Ellison's plotting of invisibility and Burdick's

[177] Sarah E. Igo, *The Averaged American: Surveys, Citizens, and the Making of a Mass Public* (Cambridge: Harvard University Press, 2009).

regressive narrative arc. To cite Pynchon's debt to the generation of novelists immediately prior, for whom the novel required serious aesthetic attention to unlikely plots, is to undo some of the confusion caused by Wood's dismissal of contemporary writers such as Zadie Smith for being merely Pynchonian. Clearly a novel such as *White Teeth* (2020) more than parrots Pynchon's style, but participates in the same strategies of miraculous coincidences and improbable realism that postwar writers used to draw attention to the strengthening of a control society contingent upon algorithmic protocol. Reading *White Teeth*, we might hope to learn, like Smith's characters, "to pick [our] way through the glazed eyes of dead statistics . . . to make sure the roads of communication stretching from one end of hell to the other were fully communicable."[178]

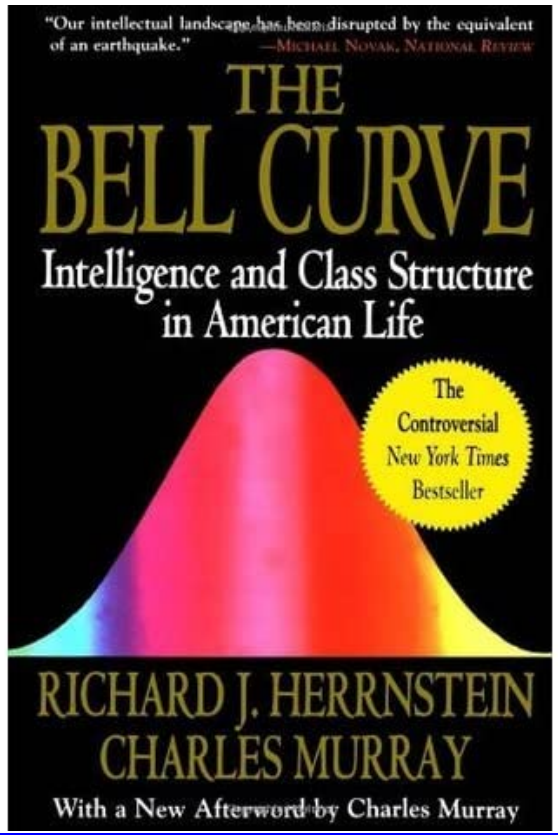

Figure 14: Cover image for The Bell Curve(New York: Free Press, 1994). *In 1994, Herrnstein and Murray featured a statistical arc on their cover, a nod to Galton's work in eugenics, specifically* Hereditary Genius *(1869).*

[178] Zadie Smith, *White Teeth: A Novel* (New York: Knopf Doubleday, 2003), 74.

In our own moment, such a society continues to grant authority to the racist foundations of Western obsessions with racial purity and attaining the point of *Brenschluss*. Consider the cover of *The Bell Curve* (1994), one of many popular regurgitations of Galton's eugenics that sought to quantify the normal distribution of intelligence as racially defined (Figure 14); not to mention countless examples in which digital modes of quantification authorize forms of oppression as elucidated in Jacqueline Wernimont's *Numbered Lives*, Safiya Noble's *Algorithms of Oppression*, and Cathy O'Neil's *Weapons of Math Destruction*—all of which were published as this dissertation was being written. Contemporary strains of quantification that reiterate previous eras of statistical sciences reinforce the question of why a 1964 exhibition featured a machine invented in 1890 to explain processes of digital computation, which itself parallels the literary question of why Nabokov, O'Connor, Ellison and other ostensible "late modernists" of American literature would advance formal techniques of nineteenth-century realism through their postwar novels. Caught between the mathematical allure of probability and the aesthetic potential of its opposite—engaged, that is, in mimetic acts of quantifying the unquantifiable—postwar novels instantiate a new reading of *Gravity's Rainbow* as the erosion of improbable realism as a literary form and its simultaneous arrival as a ubiquitous cultural paradigm of the digital age.

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